



FRIDAY, JULY 25.

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Contributions.

The Locomotive and Electric Motor—Correction.

A typographical error spoiled the point of Mr. Moss' concluding sentence in his communication on the Efficiency of the Locomotive and the Electric Motor, which appeared in our last issue. Mr. Moss wrote: "The concluding estimate would not apply to a high tension system, nor to one where the investors were willing to spend more than \$15,000 per car for motive power, as was done in this experiment," not \$1,500 as was printed. One who read carefully what preceded would detect the error.

Fast Trains.

EASTON, PA., July 19, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

We have so long looked to England to make the pace in railroad speed that when you said in an editorial note of May 9 last that the new B. & O. train from New York to Washington had no equal for the same distance, some of us non-professionals were rather surprised.

Thinking of it again the other day, I endeavored to examine your statement by reference to Foxwell and Farrer's "Handbook of Express Trains," from which I have made a little comparative table showing the distances run by, and the speeds of, what I believe to be at present the five fastest trains in the world, for the given distances.

Miles.	Stations.	Time.	Speed, including stops.	Speed, including stops.	
Great Northern.					
0 187½ 392½	Kings Cross York..... Edinburgh.....	H. M. 3:45 4:45	50.1 43.1	} 46.2	
Pennsylvania.					
0 224.9	Jersey City..... Washington.....	4:52			46.2
Northwestern.					
0 299½ 400½	Euston..... Carlisle..... Edinburgh.....	6:27 2:03	46.4 49.1	} 47.1	
Baltimore & Ohio.					
0 225.3	Jersey City..... Washington.....	4:38			48.6
Midland.					
0 204	St. Pancras..... Leeds.....	4:07		49.5	

The English speeds are those of regular trains from London to Edinburgh, and are not taken from the time-tables of the famous racing week of 1888.

The distances, I hope, will be considered comparable. Your statement is verified.

C. HERSCHEL KOYL.

The Railroad Development of Utah.

SALT LAKE CITY, June 24, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE.

Your editorial on railroad building "From Denver to Salt Lake," in your issue of June 20 was noted with interest. In my letter to you it was not intended to give the impression that new lines would be built through

the mountains of Colorado to Utah, but that new lines would without doubt be constructed westward that would come in direct competition for through business with the present lines, and that branch lines from these new through lines would probably enter the local territory of the old road, giving relief to certain localities, and causing an increase in trade sufficient to support both roads. The territory around Salt Lake City contains immense wealth in minerals, coal, marble, building stone, asphaltum, salt and other commodities needed in the commercial world, all of which are desirable freight to handle. Immense droves of cattle and horses are also offered for shipment yearly. Utah has a great wealth in her flocks of sheep, the wool from which is marketed in the East. This is what is offered for shipment. The incoming freight covers almost every article in the classification.

Salt Lake City has not been treated by the Union Pacific as it should be. To show the condition of affairs here I quote from an editorial in the Salt Lake Tribune, the leading journal of this section, under date of June 24. [The editorial referred to is too long to reproduce here. It is dignified and interesting. The line of the argument is that the legitimate territory of the Union Pacific which it could now develop with greatest profit to itself is in Utah; that, as a matter of consistency and of present policy, the energies and financial resources of the company should be expended in Utah rather than in the State of Washington and in Texas; that the company owes something to Utah because of the large and profitable traffic which it gets there, and also because of the immunity which it has enjoyed from hostile legislation. But it is said that the company is doing little to develop its lines in the territory and that it furnishes insufficient service and accommodation in track, rolling stock, yards, freight houses and stations, and that it is not treating Utah fairly in the development of new regions.—EDITOR.]

This is not empty talk. The Tribune is a journal noted for its justice. It would seem that there was room for "a stranger road" here in addition to the Rio Grande Western.

In regard to the great obstructions that nature has placed in the way of constructing additional lines between the Denver locality and Salt Lake locality, I beg to call attention to the fact that southern Wyoming offers no great obstacles in the form of grades to east and west lines. It is true that there are some very long grades over the hills, but they are about equal in both directions and permit an economic use of power. The writer has been advised by the President of the new Pacific short-line of the maximum grade of that line between O'Neill, Neb., and Ogden. It is less than the maximum grades on many of the large roads in Ohio or Indiana.

The cost of maintenance of the Wyoming division of the Union Pacific has been small. They have hundreds of miles of track without ballast, use soft wood ties which last from seven to ten years, and use small gangs of men to a section. The Burlington is now in Cheyenne, and I venture to state that it could construct a line from that point to Salt Lake City at a cost not to exceed 10 per cent. per mile more than the cost of its Omaha-Denver line. Such a line would be a true Denver-Salt Lake line, with Utah as its western source of trade.

Last December the articles of incorporation of the Colorado & Utah Pacific were filed in Denver. This company proposes to overcome the impassable features and get into Salt Lake with a line some 200 miles shorter than the line via the Union Pacific and 250 miles shorter than the Rio Grande. There is a large business awaiting the arrival of the first newcomer.

DE.

The Master Mechanics' Association.

Milwaukee, West Shore & Western Railway Co.,
Machinery Department.
KAUKAUNA, July 6, 1890.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of June 27, under the heading, "The Convention of the Master Mechanics' Association," appears the following passage: "Still other members do not like the methods of conducting business now followed by the Master Mechanics, and, instead of remaining to help, they go away and thus weaken the number of those who are trying to bring about reforms."

From this one would infer that the manner of conducting the business of the American Railway Master Mechanics' Association is not in harmony with approved methods followed by similar gatherings and sister associations; that as a society established for the discussion and solution of railroad mechanical problems its usefulness is thereby crippled, and as a consequence many prominent members absent themselves from the annual meetings.

In the interest of fairness and in justice to the large number of active members of the Association, may I ask you to state what the usages of the Association are in need of reform? What efforts have been made towards improving its working methods that have miscarried? What custom of the Association is so obnoxious as to justify prominent members from remaining away from the annual meetings? In short, wherein has the Association in any manner departed from its path of usefulness and honor?

As one who has long and earnestly taken part in the

work of the Association, has full knowledge of the untiring industry displayed by its many committees of research, and who has largely profited by their teachings, I deem it a duty to seek an explanation, not only of the clause in your editorial referred to, but any other published assertion bearing any semblance to a reflection on the Association. Permit me to add that, while I feel that the work of the Association has not, perhaps, at all times been as efficient as it might have been, it is no less a fact that its record, its work and the character and amount of information it has given to the technical world, especially to the Mechanical Departments of railroads, will compare favorably with the production of any organization in this or any other country.

I beg to assure you of my continued high regard for your journal and its work, and let me say that the support it has heretofore rendered to mechanical associations in this country has been highly appreciated; and allow me to say further, in this communication, I desire not to give the smallest uneasiness to any gentleman connected with your paper, with some of whom I have the honor to be acquainted, and for whom I feel much personal respect. JOHN HICKEY, Master Mechanic.

[We stated a "condition, not a theory," when we mentioned the fact that "a considerable number of prominent members who attended the first meeting did not stay for the second." We did not say that they were justified in going away, but on the contrary implied that they ought to have stayed if they could. Why they went away we cannot explain in any detail. Undoubtedly the Master Mechanics' Association was at some disadvantage in having its convention follow, rather than precede, that of the Master Car Builders. The joint committee appointed to consider the best arrangement of the conventions, will attend to this difficulty. Certainly there is considerable grumbling among the members concerning the conduct of its business; but we do not care to undertake to express for them complaints which are sometimes personal, sometimes matters of feeling difficult to express accurately, and generally inappropriate for public discussion. Mr. Hickey can learn what these complaints are, judge of their weight and do much to stop them by personal intercourse and correspondence. In the editorial referred to we mentioned some of the things that have been done and others that may be done to make these conventions more attractive and valuable. It is hardly necessary to say that we thoroughly appreciate the conscientious and valuable work which the Association has done in the last 23 years and that we have no doubt that it has before it many years of still greater usefulness.—EDITOR RAILROAD GAZETTE.]

19 in. x 26 in. Mogul—Brooks Locomotive Works.

The mogul locomotive illustrated herewith is a standard of the New York Central & Hudson River Railroad. The first one was built by the Brooks Locomotive Works from their own designs. Recently large orders have been given to other builders, as well as Brooks, for the same engine. It is a 19x26 mogul locomotive with a fire box above the frames. It has a wagon top boiler with crown bars. The wheel base is 14 ft. The distance between the front and main pair of wheels is greater than that between the main and rear pair; to this there is no objection; but it is not a common arrangement. It has an advantage in giving a longer radius to the link. The fire box is held by links to the frames with pads on the sides of the fire box, as is usual with this form of support. The frame braces are welded in with a pedestal brace formed by a thimble and through bolt.

The equalizing system is extremely simple and well arranged. The weight of the spring steel carrying the locomotive is small, and it is quite evident, from the number of designs of this sort recently introduced, that coil springs for supporting locomotives are meeting with increased favor. They are cheaper, weigh less, and occupy a minimum space. The connection between the spring links over the coil springs is worthy of comment; it consists of a flat key inserted in a slot. With this arrangement, which is, however, slightly more expensive, the springs can be quickly removed without taking out the pins in the ends of the equalizers, which is always a troublesome job.

The attachment of the front frame rail to the front jaw is a little uncommon, but looks substantial, and it is seldom that it is possible to run the lower front frame rail as straight as here shown without interfering with the truck; but in this case the large diameter of the driving wheels and the use of a 30-inch truck wheel allows sufficient clearance. This construction makes a decidedly strong front end. The splice of the top front frame rail is none too long, but probably it had to be shortened in order to clear the end of the cross equalizer.

The front truck is certainly a stiff one, the swing links being quite short at 6 in., with 1 in. inclination inward each. The centre bearing is a ball instead of a flat, as is more commonly used. This spherical bearing is an improvement, as it increases the flexibility of the

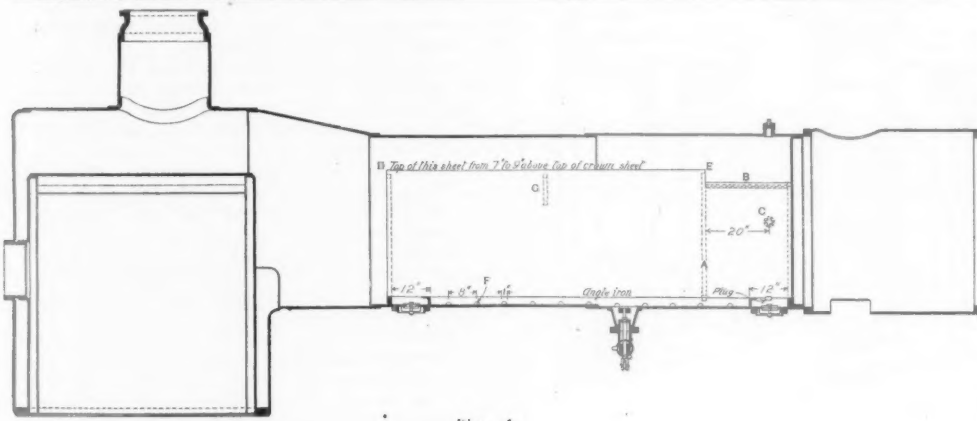


Fig. 1.

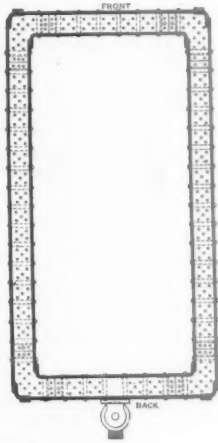


Fig. 4.

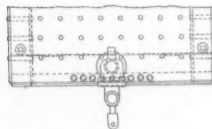


Fig. 3.

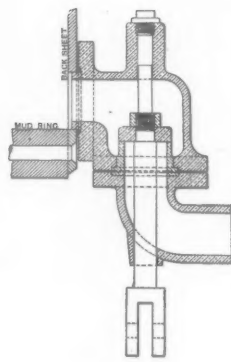


Fig. 5.

Blow-off Cock.

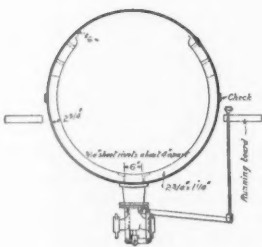


Fig. 2.

Section back of flue sheet, looking back.

BARNES' "WATER PURGER."

ence is fair that the price was profitable and the rates of transportation reasonable and just. Or, because a mill runs for months making and selling rails that the price is a profitable one. Perhaps, if on such a theory the duty were removed from steel rails and other railroad supplies it might be possible to materially reduce rates on wheat and corn from trans-Missouri points. This deduction of the Commission, though not a departure from the character of its rulings in the past, is hardly worthy a national body of its position and dignity. It sounds like charlatanry.

The lines affected by this decision traversing the corn and wheat belts do 22 per cent. as much business as do the lines eastward from Chicago, a trifle over one-fifth. The Commission can but be aware of the fact that volume is an important factor in the cost of transportation, yet with this fact before them, showing that the average cost to these roads of moving a ton of freight one mile was about seven mills, they name a rate of less than this cost for moving the property under consideration.

They give the distance from Omaha to Chicago as 490 miles and the rate not to exceed 17 cents, or $\frac{1}{10}$ cent per ton-mile. To the Mississippi River, east side, the rate is not to exceed 12 cents, or $\frac{1}{10}$ cent per ton-mile. On wheat the railroads may be permitted to charge 15 per cent. more, or to Chicago from Omaha eight mills. As the report shows, the actual cost of doing the work is an average of seven mills (with some it is nearly 10), it will be seen that interest cost has not entered into these calculations at all.

On this question of interest as a factor in the cost of transportation the critic of this report and opinion may be pardoned if he infers that the Commission being improperly informed, its deductions are proportionally incorrect. If it has been guided in its conclusions by the figures it quotes on page 11 of the report, it has led itself into serious error, since the capitalization of several of the roads therein, mentioned, is egregiously misstated. The funded debt of the B. & O. is overstated more than thirty-five million, the Lake Shore over three million, the Chicago & Alton three millions and all of them sufficiently out of the way to seriously affect the integrity of any calculations made upon them; while the cost of property as compared with the capitalization is so wholly at variance with the known truth as to be ludicrous if serious results were not involved. What possible basis they had for the statement here made that the capitalization of the New York Central and Hudson River, including the West Shore, is $\frac{1}{10}$ per cent. less than its cost, while the other railroads are capitalized above their cost as per the figures below, only their wisdom can reveal.

The following is a list of Eastern trunk lines with the

percentum of capitalization above their cost as appearing on page 11 of the report:

	Per cent.
N. Y., L. E. & W. and N. Y., P. & O.	1 $\frac{1}{2}$
Pennsylvania road east of Ohio.	4
Michigan Central.	6
Delaware, Lackawanna & West.	9
Lake Shore & Michigan Southern.	15
Baltimore & Ohio.	42

It would be painfully surprising to the security holders of the Baltimore & Ohio to learn from this authoritative source that there is more water in their securities than in those of the Erie and the N. Y., P. & O.

The misfortune about such a report is that, being the utterance of a department of the Government, it will receive credence at home and abroad as dispassionate, unbiased and trustworthy, while it is replete with misstatements of easily ascertained facts.

The report lays some stress upon the interest cost of transportation and makes invidious comparisons between some lines, and inferentially between all of them. The following statement shows the cost in interest or funded debt of carrying one ton of freight one mile along the lines named:

Lines East of Chicago.	Mills.	Lines West of Chicago.	Mills.
Pennsylvania Railroad		Ill. Central.	1.38
Co.		Chicago & Alton.	1.46
N. Y., L. E. & W. and N. Y., P. & O.	1	A. T. & Santa Fe.	1.97
Y. P. & O.	1.2	C. & Northwest.	1.95
Baltimore & Ohio.	1.3	Union Pacific.	2.77
N. Y., C. & H. R. and W. Shore.	1.35	Fre. Elk. & M. V.	4.80
		Dubuque & S. C.	4.80

From this it will be seen that the difference of 100 per cent. in bonded debt of the Atchison over the Alton road does not operate, as the report would indicate, to enhance the rates of transportation over the former road, while, in the case of the Union Pacific, the funded debt of which is nearly five times as great as that of its paralleling competitor, the Fremont, Elkhorn & Missouri Valley, the superior traffic or the greater economy of conducting it, or both, is such as to wholly overcome this difference, the saving in the cost of carriage on the Union Pacific over that on the Fremont, Elkhorn & Missouri Valley being 3.68 mills per ton mile, while the difference in interest cost per ton mile is equally in favor of the more heavily indebted railroad.

With a knowledge of the above discrepancies between the declarations of the report and the facts, its opinions will be taken *cum grano salis*. J. V. McNEAL, Auditor I. D. & W. Ry.

Barnes' "Water Purger."

The feed-water purifier shown herewith for locomotive boilers is the invention of Mr. J. B. Barnes, Superintendent of Motive Power and Machinery of the Wabash Railroad. This device has been in use for some

months with such good success that it is being applied to a number of engines on that road.

The construction and operation are as follows: Inside of the barrel of the boiler is a sheet of steel riveted at each end to solid rings $2\frac{1}{4}$ in. \times $1\frac{1}{4}$ in., making the space between the shell and this sheet water tight at the ends. A third ring is riveted from 25 to 30 in. back of the front ring in like manner with the exception that it has an opening of 12 in. at the bottom, as shown. This inside sheet extends around the inside of the boiler up to 7 to 9 in. above the top of the crown sheet, where it is flanged over, as shown in fig. 2, to within three-fourths of an inch of the shell. At the front end this sheet is dropped about 6 in. to clear the flue sheet braces and boilerside seams. Between the front ring and the intermediate ring A, fig. 1, the sheet is riveted water tight to the shell at the top at B. The water entering through the jacket at C is therefore compelled to pass downward through the opening in the bottom of the ring A, and then rise to the top of the interior sheet along the line D E before it can enter the boiler or reach the flues. Meantime the water has become heated to a boiling temperature, and the impurities and foreign matter are precipitated to the bottom. The inside sheet rests at the bottom on angle iron, as shown in figs. 1 and 2, which angle iron has semi-circular openings, as shown at F, fig. 1. The inside sheet is braced by a short stay at G, fig. 1.

Careful observation shows that only the very lightest of the foreign matter in the water flows over the top of this sheet, and the water in the boiler is not changed from the time of first filling after renewing the fire box and flues. That is, it is never entirely blown out. It is only necessary to open the blow-off valve for a few seconds on the first 50-mile run after repairs; this thoroughly removes all the grease and matter that acts to produce foaming.

A special blow-off valve designed by Mr. Barnes is placed under the shell, as shown, and is operated by a handle from the running board. When this valve is open the steam rushes down between the two sheets, carrying with it all foreign matter and thoroughly cleansing the portion of the boiler between the inner and outer sheets. It acts as a sort of skimmer, and removes all floating matter or scum from the top of the water as well as all sediment.

End hole plates are placed on the under side of the shell at each end of the sheet. This is for the purpose of making examinations and to wash out with pressure from water pumps, if necessary. It is said that if the blow-off valve is left wide open, even with a heavy fire in the furnace, there is no danger whatever of damaging the boiler by burning, as it remains full of purified water several inches above the crown sheet. A 2-in. plug is placed in the inside sheet, above the front end hole plate, as shown in fig. 1, simply for the purpose of examining the condition of the flues in the front end.

In the leg of the fire box is placed a perforated sheet which rests on the lower row of stay bolts immediately above the mud ring, and the special blow-off valve is placed between this sheet and the ring. When the valve is open the water rushes through the perforations, thoroughly cleansing and washing the mud ring of foreign matters, if there are any. This construction is clearly shown in figs. 3 and 4.

The blow-off valve is shown in section in fig. 5, from which the construction can be easily understood.

It is claimed that placing the inside sheet in the barrel of the boiler not only strengthens it, but prolongs its life, and it is impossible for the mud or scale accumulations to adhere to it. It is also claimed that the water circulation is much improved by admitting it in the manner described.

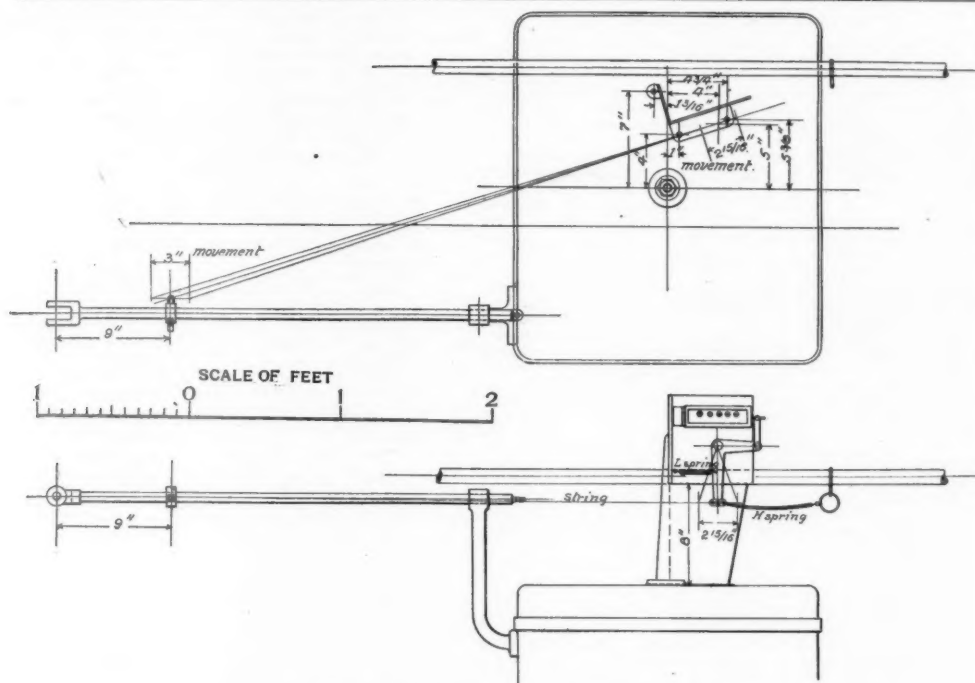
The water on the Wabash road is very bad and the engines formerly required frequent washing out. A number of engines with this device have run 10,000 miles without having one washing and the water is very clear. It is found that where old scale and mud have not been thoroughly removed from the engines while at the shop for repairs, the action of the purified water tends to lessen and dissolve the old scale, after which it appears at and is discharged through the blow-off valves. On February last a number of engines were put in service with this apparatus and have since been carefully watched. The results we shall give later.

Counter Gear for Locomotives.

The counter gear illustrated in this issue was designed and used by F. W. Dean when testing locomotive 148 on the Old Colony Railroad, of which we published a table of results in our issue of June 27. The method of using this gear was described in a general way in the articles on "A Standard Method of Testing Locomotives" in the issues of June 30 and 27. The following is a detailed description of the device:

A Schaefer & Budenburg counter was screwed to a sheet iron stand as shown, and this stand was screwed to the top of the steam chest casing in such a position that the numbers on the counter could be easily seen. Motion was imparted by means of a cord connected to a staple driven into an iron ring which was secured to the reach rod of the indicator gear by means of a set-screw. This will be plainly seen by reference to the engravings in our issue of Feb. 28, 1890.

With this arrangement the counter did not operate



COUNTER GEAR RUN BY INDICATOR GEAR.
FOR STANDARD 18 x 24 PASSENGER LOCOMOTIVE.

except when desired. The L-spring kept the counter lever against a stop, and the actuating cord was loose when out of use. When the counter was operated the ring at the end of the H-spring was pulled by one hand as quickly as possible, while the watch was held by the other. The tension of the H-spring was sufficient to overcome that of the other spring, and to keep the actuating cord taut. The counter was thrown into operation immediately after taking an indicator diagram, and before removing the cord from the indicator. A special small note book for the counter records was used, and in it were written the readings of the counter before and after using, and the number of seconds during which it was used. These records are, of course, subject to human errors, and the device must be used with great care and promptness. An electrical chronograph device would, doubtless, be an improvement.

Iron Surface Cattle Guard.

The accompanying cuts illustrate a cattle guard invented by Mr. Parker Merrill and manufactured by the Kalamazoo Cattle Guard Co., Kalamazoo, Mich. The guard is made in four sections, consisting of rectangular iron bars supported on hollow iron cross beams as shown, the ends of the beams being made fast to longitudinal strips. Fig. 1 is a prospective view of the guard; fig. 2 is a section and a detail showing the manner of securing the frame. The bars forming the surface are set so as to present an edge uppermost and sloping surfaces between, and the guard is in fact the old wooden surface guard made of stronger and more durable material. We have no reports as to its efficiency.

The first of these guards made for trial were put on the Michigan Central main line a few months ago, and that company now has them in actual service.

Train Accidents in June. COLLISIONS.

REAR.

5th, on New York, Lake Erie & Western, near Elmira, N. Y., a freight train entering a side track broke in two and the rear portion ran back on to the main track and was struck by a fast freight train, damaging engine, caboose and three cars.

6th, on Des Moines Union road, at Des Moines, Ia., a Wabash passenger train ran into the rear end of a Chicago, St. Paul & Kansas City passenger train. An engine and a coach were damaged and a trainman injured.

6th, on Chattanooga, Rome & Columbus, at Taliaferro, Ga., a freight train ran into the rear of another freight which had stopped on a curve in a cut, wrecking engine and 15 cars. Engineer killed, fireman, conductor and brakeman injured. It is said no flag was sent back by the standing train.

7th, on Pennsylvania, near Valley Creek, Pa., a westbound freight ran into the rear of another freight, throwing some of the wreckage over on the opposite track in front of an approaching eastbound freight. Twelve cars and 2 engines wrecked.

8th, on Pittsburgh, Cincinnati & St. Louis, at Union, O., a freight train ran into the rear of a preceding freight, disabling the engine and derailing a number of cars. Engineer hurt.

9th, night, on Chicago, Burlington & Quincy, at Naperville, Ill., a freight train ran over a misplaced switch and into the rear of another freight, wrecking engine and several cars. Brakeman injured.

11th, on New York, Lake Erie & Western, near Coopers, N. Y., a passenger train ran over a misplaced switch and into the rear of a construction train standing on a siding, causing considerable damage. Engineer badly hurt.

12th, on Illinois Central, at Ft. Jefferson, Ky., a freight train ran into the rear of another freight, wrecking engine and 5 cars.

13th, on Kansas City, Memphis & Birmingham, near Jasper, Ala., a passenger train was run into at the rear by a freight train, causing slight damage.

13th, on Lehigh Valley road, near Towanda, Pa., a freight train standing on the main track was run into at the rear by another freight, piling up engine and 20 cars in a bad wreck. It is said that the foremost train neglected to send back a flag.

13th, on Chicago & Eastern Illinois, at Danville, Ill., a passenger train ran into the rear of a freight train, derailing the forward part of the train. Two passengers injured.

14th, on Central of Georgia, at Pomora, Ga., a standing freight was run into at the rear by another freight, doing slight damage. Two trainmen injured by jumping.

14th, on Queen and Crescent Route, at Flat Rock, Ky., a freight train ran into the rear of a preceding freight, wrecking engine and several cars. Two cars containing oil were ignited and burnt up. Engineer hurt.

15th, on Missouri, Kansas & Texas, at Nacoma, Tex., a passenger train standing at the station was run into at the rear by a special officers' train. Engine and rear car wrecked; fireman and several passengers injured.

15th, night, on Missouri, Kansas & Texas, at Denison, Tex., a switch engine collided with a box car, injuring the fireman. It is stated that a low-hanging electric light interfered with the engineer's view of the track.

16th, at 2 a. m., on Chicago & Northwestern, near La Fox, Ill., a freight train ran into the rear of a preceding freight, and was in turn run into by a closely following freight, wrecking 2 engines and cabooses and a number of cars. Three drovers were slightly injured.

17th, on Cleveland, Cincinnati, Chicago & St. Louis, at Brightwood, Ind., a passenger train ran into the rear of a freight train entering a siding, damaging engine, baggage car, caboose and 1 freight car. Engineer hurt.

17th, on Delaware & Hudson Canal Co.'s road, at Sandy Hill, N. Y., a freight train collided with a box car, which had run down grade out of a siding on to the main track, doing some damage.

18th, at Seattle, Wash., a Northern Pacific freight, which had stopped to do some switching, was run into at the rear by a Columbia & Puget Sound coal train. Engine and caboose wrecked and a number of cars de-

railed. Several passengers riding in the caboose were injured.

19th, on Baltimore & Ohio Southwestern, at Blanchester, O., a passenger train ran over a misplaced switch and into the rear of a passenger train standing on a siding, doing some damage. A brakeman of the standing train, who had fallen asleep and awoke in confusion, threw the switch wrong in the face of the approaching train.

20th, on Pennsylvania, near Buffalo Mills, Pa., a freight train broke in two and the rear portion ran back down grade and collided with a following freight, wrecking engine, caboose and a number of cars. One trainman killed and five injured. It is said that the trainmen in the caboose of the runaway were asleep.

25th, on Chicago, Rock Island & Pacific, near Joliet, Ill., an eastbound freight train descending a steep grade broke into three parts, which afterward collided, making a bad wreck. Brakeman killed.

25th, on Georgia Midland & Gulf, at Warm Springs, Ga., a freight train entering a side track was run into by a following freight, wrecking engine, caboose and several cars.

25th, on Lake Shore & Michigan Southern, in Cleveland, O., a passenger train ran into some cars loaded with ice which had run down grade out of a siding on to the main track, disabling the locomotive.

25th, on Baltimore & Ohio, at West Junction, Md., an empty passenger train ran into the rear of a standing freight train in a fog, doing considerable damage. Engineer hurt.

27th, on Cleveland, Cincinnati, Chicago & St. Louis, at Cardington, O., freight train ran into the rear of a preceding freight, doing slight damage.

27th, on New York, Lake Erie & Western, near Masthope, Pa., collisions between three westbound freight trains, the engine of the foremost train having been disabled, and the train unexpectedly stopped. Two engines and about 20 cars wrecked.

27th, on New York, Philadelphia & Norfolk, at Birdnest, Va., freight train ran into the rear of another freight, wrecking an engine and 6 cars.

29th, on Pennsylvania, at North Bend, Pa., an eastbound freight train broke in two and the detached portions collided, wrecking a number of cars. Conductor injured.

REAR.

2d, on Central of Georgia, near Martins, Ga., a freight train ran over a misplaced switch and into an engine with a pile driver which had been backed on to a siding for the night, doing considerable damage and killing a fireman.

3d, on Long Island road, at Long Island City, N. Y., butting collision between two passenger trains, due to a misplaced switch, doing some damage. One trainman and 3 passengers injured, one of the latter in leaping from the train.

7th, on Baltimore & Ohio, near Duffield, Va., butting collision between passenger and construction trains, wrecking both engines and derailing several cars in each train. One trainman, 3 employes and 2 passengers injured.

8th, on San Francisco & North Pacific, near Reed's Station, Cal., butting collision between a passenger train and an excursion train running contrary to orders, disabling the locomotives.

9th, on Illinois Central, near Oakfield, Tenn., butting collision between two freights, the runner of one of them having fallen asleep and run past a meeting point. Both engines and a number of cars wrecked and several trainmen injured.

9th, at 1.45 a. m., on Wabash road, near Warrenton, Mo., butting collision between two freight trains running at speed, wrecking both engines and 18 cars, including 8 cars containing race horses and their attendants. Eight of the latter were killed and 8 others, together with 3 trainmen, were injured. Nine valuable horses were also killed and a number of others maimed. The collision was caused by the delivery of a telegraphic order reading 2 hours and 50 minutes late instead of 2 hours and 5 minutes late.

9th, on St. Louis, Keokuk & Northwestern, near Busch, Ia., butting collision between a freight train and a construction train on a curve, wrecking both engines and 12 cars. Two firemen were scalded to death, and three other trainmen injured. The accident was caused by a dispatcher's mistake.

9th, night, on Chesapeake & Ohio, in Cincinnati, O., butting collision between a freight train and a yard engine. Both engines were derailed and, together with a box car, thrown off a bridge on to the track of the C. & St. L. road, wrecking them completely.

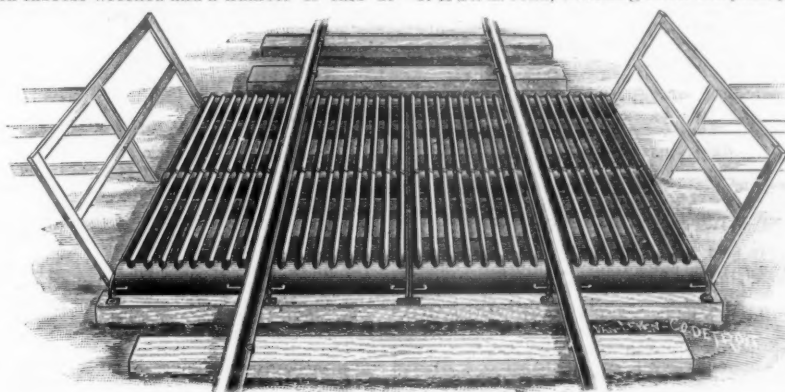


Fig. 1.

The Kalamazoo Iron Cattle Guard.

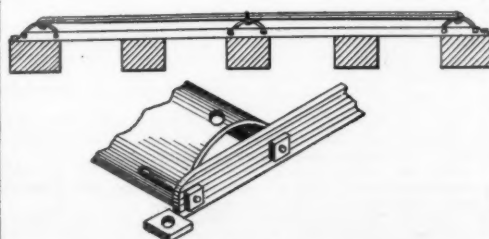


Fig. 2.

11th, on Chicago, Santa Fe & California, near Millsdale, Ill., butting collision between 2 gravel trains on a curve, wrecking both engines. Engineer killed, fireman and conductor injured.

12th, on Atchison, Topeka & Santa Fe, near Ortez, N. M., butting collision between two freight trains, demolishing three locomotives and a number of cars. Two firemen killed.

13th, on Kansas City, Memphis & Birmingham, near Cordova, Ala., butting collision in a cut between a freight train and a construction train. Engines and several cars wrecked.

15th, on Wisconsin Central, near Chippewa Falls, Wis.,

butting collision between a passenger train and a freight train, wrecking the forward portion of both trains. Two trainmen seriously and several passengers slightly injured.

19th, on Kansas City, St. Joseph & Council Bluffs, at Rushville, Mo., butting collision between a pay train running at high speed and a freight train about to take a siding, wrecking both engines and several cars loaded with horses. Engineer killed and conductor and four other occupants of the pay car injured.

25th, on Evansville & Terre Haute, near Purcell's, Ind., butting collision between two freight trains, due to a misunderstanding of orders. Engines and ten cars wrecked. Engineer and a tramp stealing a ride killed.

25th, on Boston & Maine, near Olcott, Me., butting collision between two freights, wrecking both engines and 14 cars.

25th, on Chicago & Northwestern, near Cheshire Junction, Mich., butting collision between a freight train and an empty engine, doing considerable damage and injuring a trainman.

25th, on Illinois Central, near Martin, Tenn., butting collision between two freights, wrecking both engines and half a dozen cars.

27th, on Pittsburgh, Fort Wayne & Chicago, at Lucas, O., butting collision between two freights, wrecking both engines and 18 cars. The wreck was fired by the explosion of a gasoline tank and almost wholly consumed.

27th, on Central of Georgia, near Verdery, S. C., butting collision between a passenger train and a construction train, wrecking both engines and baggage and express cars. Two trainmen injured.

29th, on New York, Lake Erie & Western, at Garfield, N. J., butting collision between two freight trains, wrecking both engines and three cars.

CROSSING AND MISCELLANEOUS.

5th, on Pittsburgh, Cincinnati & St. Louis, at Hanover, O., a fast freight train ran into the side of another freight pulling out of a siding, wrecking engine and 15 cars. Engineer hurt.

7th, on South Atlantic & Ohio, near Natural Tunnel, Va., collision between a mixed train and a construction train, wrecking both engines and several box cars. Engineer, 3 laborers and 2 passengers injured.

9th, on Buffalo, Rochester & Pittsburgh, at Bradford, Pa., collision between two engines, injuring 3 trainmen. An engine sent out to assist a wrecked freight ran into it, injuring 10 employees riding on the locomotive.

9th, on West Jersey road, at Camden, N. J., collision between switching passenger train and a yard engine, doing slight damage.

10th, on New York, Lake Erie & Western, at Waverly, N. Y., collision between two engines, due to a misplaced switch. Engineer hurt.

11th, at the crossing in Cleveland, O., owing to a mistake in signaling, a Cleveland, Canton & Southern passenger train was run into by a Cleveland & Pittsburgh freight. One passenger car was overturned and wrecked, injuring 6 passengers.

13th, on Atlantic Coast Line, at Florence, S. C., collision between a freight and a switching engine, the latter being pushed against a passenger train so as to badly damage a sleeping car.

16th, at Negaunee, Mich., collision between Duluth, South Shore & Atlantic ore train and Chicago & Northwestern switching train.

20th, on Burlington & Missouri River, at Beatrice, Neb., collision between a special passenger train and a yard engine, disabling both locomotives.

22d, at 9:20 a. m., on East Tennessee, Virginia & Georgia, near Calera, Ala., the engine of a passenger train, which had been cut loose for the purpose of running to a coal shed three-quarters of a mile away, collided with an opposite-bound freight train. The detached engine, having been abandoned (with reversed lever) before the collision, ran back into its own train with such force as to badly wreck an express car and the forward end of one coach, killing a passenger and injuring 3 others.

22d, on Birmingham Mineral road, a car loaded with cinders standing on a siding at Gate City, Ala., was started by a switch engine accidentally bumping against it and ran down grade to Trussville, 6 miles, where it collided with a freight train, wrecking it and the engine.

26th, on New York, Lake Erie & Western, near Andover, N. Y., an excursion train ran into the side of a freight train backing on to the main track, doing considerable damage and injuring 4 passengers.

27th, at the crossing at Gates, Va., a Norfolk & Carolina freight train was run into by a train of the Suffolk Lumber Co., causing considerable damage.

28th, on Philadelphia & Reading, at Centre Valley, Pa., a northbound passenger train which was not controlled ran past the station. In backing up it collided with a following freight train and wrecked the rear car, injuring 2 passengers.

DERAILMENTS.

DEFECTS OF ROAD.

6th, 4 p. m., on Louisville & Nashville, near English, Ky., a passenger train, consisting of engine, one coach and a sleeper, running about 20 miles an hour, was thrown from the track by the spreading of the rails on an embankment which had just been repaired and which had been weakened by heavy rains. The sleeping car broke in two near the forward end, the rear part rolling down the embankment, injuring 3 officers of the road, 2 trainmen and 4 passengers, 2 of the latter seriously.

9th, on Southern Pacific, near Folsom, Cal., engine and 4 freight cars of a mixed train were thrown from the track by the spreading of the rails. Engineer and fireman badly scalded.

9th, on Southern Pacific, near Bagdad, Cal., a freight train ran into a burned bridge and was badly wrecked. Engineer killed.

12th, night, on Chesapeake & Ohio, near Maysville, Ky., a freight train plunged into a creek, the bridge over which had been swept away by a "cloudburst." The locomotive and 9 cars went into the creek, the engineer, fireman and a brakeman being buried beneath the wreck and killed.

16th, on Chicago, Burlington & Quincy, near Island Park, Ia., passenger train thrown from the track by the spreading of the rails, 3 cars being overturned in the ditch. Four passengers injured.

21st, on Georgia Pacific, at Gate City, Ala., the hind truck of rear car of a passenger train took the siding at a switch, and the car was twisted around, overturned and badly damaged, injuring 14 passengers.

28th, on Missouri Pacific, near Nevada, Mo., a passenger train was thrown from the track by the spreading of the rails at a curve, and 3 cars were thrown over an embankment and wrecked. Conductor and 1 passenger fatally and 27 passengers more or less severely injured.

DEFECTS OF EQUIPMENT.

3d, on Louisville & Nashville, near Louisville, Ky., several cars of freight train derailed by the breaking of a wheel.

9th, on Florida Central & Peninsular, at Ocklocknee, Fla., a freight train was derailed by the breaking of a wheel on a trestle, and 8 cars went down into the Ocklocknee River.

11th, on Lehigh & Susquehanna, near Stemton, Pa., an axle under a car in a coal train broke, and 20 cars were derailed and thrown over an embankment.

12th, on Southern Pacific, near Sansevain, Cal., 11 cars of a freight train were derailed by the breaking of a wheel under one of them.

14th, on Boston & Albany, at Springfield, Mass., tender of a New York, New Haven & Hartford passenger engine derailed by a broken axle, just after it had arrived from New Haven and had uncoupled from the train.

14th, on Richmond & Danville, near Marshall, N. C., passenger train derailed by the breaking of a tender truck, overturning the two rear cars. One passenger killed and 2 passengers seriously and 9 slightly injured.

14th, on Union Pacific, near Dillon's, Mont., 6 cars of a freight train loaded with sheep were derailed and wrecked by the dropping of a spring plank. Brakeman killed.

17th, on Baltimore & Ohio, near Zanesville, O., 10 cars of a freight train derailed and wrecked by the breaking of a draw-bar.

17th, night, on New York Central & Hudson River, at Fordham, N. Y., the engine of a New York, New Haven & Hartford passenger train was derailed by the breaking of a journal.

17th, on Philadelphia, Wilmington & Baltimore, near Northeast, Md., 11 cars of a freight train were derailed and wrecked by the breaking of an axle.

20th, about 1:30 a. m., on Baltimore & Ohio, near Childs, Md., engine of north bound passenger train running at high speed broke both parallel rods, totally demolishing the cab and causing derailment of the train, one sleeping car being thrown off a bridge into a road below and broken in two. An officer of the road in the latter, together with the fireman, was killed, porter and 13 passengers injured.

20th, on Nashville, Chattanooga & St. Louis, near Whiteside, Tenn., 8 cars of a freight train were derailed by the breaking of a truck.

21st, on New York, Pennsylvania & Ohio, near Shattuck, O., a car of a freight train broke down and a dozen cars were derailed and damaged.

22d, on Gulf, Colorado & Santa Fe, near Gainesville, Tex., tender of passenger train derailed by a broken axle.

23d, on Wabash, near Silver City, Ia., engine of passenger train derailed and wrecked by the breaking of a flange. Fireman killed.

23d, on Western & Atlantic, near Ringgold, Ga., freight train derailed by the breaking of an axle.

NEGLECT IN OPERATING.

5th, on Southern Pacific, near San Juan, Cal., passenger train derailed by a misplaced switch. Engineer hurt.

12th, on Philadelphia & Reading ("river front railroad"), in Philadelphia, Pa., freight train derailed at a misplaced switch, one car being thrown into an adjacent stream. A man riding on the car was drowned, and another badly injured.

12th, 3 p. m., on New York, New Haven & Hartford, at East River, Conn., an east bound freight train ran upon the draw of a bridge before it was completely closed. The engine and several cars were derailed, and the road was blocked several hours. The reports indicate that the danger signal was properly displayed.

14th, on Pennsylvania, at Philadelphia, an outgoing accommodation train, in order to avert collision with an empty passenger train was turned on to and ran off the end of a spur track, partially demolishing a signal tower.

21st, on Missouri, Kansas & Texas, at Mazie, I. T., a freight train ran over a misplaced switch, wrecking engine and 10 cars. Fireman killed.

23d, on Philadelphia & Reading, near Tuckerton, Pa., passenger train running at speed was derailed by a misplaced switch, and engine and forward cars were overturned and badly wrecked. Engineer and fireman killed and 2 other trainmen injured.

25th, on Union Pacific, at Pueblo, Col., a freight train was derailed at a misplaced switch and the engine overturned in the ditch.

UNFORESEEN OBSTRUCTIONS.

3d, on Chicago, St. Paul & Kansas City, near Menominee, Ill., 14 cars of a freight train derailed and ditched at a washout. Fireman killed and a brakeman badly injured.

4th, on New York Central & Hudson River, near Albion, N. Y., 3 coaches and a sleeper of a passenger train were derailed at a culvert which had been impaired by a freshet.

4th, on Illinois Central, near Ackley, Ia., a fast stock train was derailed by a washout, wrecking 7 cars and killing 100 head of cattle.

5th, on New York, Lake Erie & Western, near Alexander, N. Y., 18 cars of a freight were wrecked at a point where rains had weakened the roadbed.

6th, on Chicago, Milwaukee & St. Paul, near Freeport, Ill., a freight train ran into a washout, wrecking engine and 14 cars.

7th, on Oregon & California, near Salem, Ore., in making a flying switch a string of freight cars ran over a horse and six cars were derailed and damaged.

10th, night, on Texas & Pacific, at Four Mile Junction, Tex., passenger train derailed by a purposely misplaced switch.

10th, on Southern Pacific, at Cibola Siding, Tex., engine and baggage car of passenger train derailed at a switch which had been tampered with. The locomotive was overturned, injuring engineer and fireman.

12th, night, on Rome, Watertown & Ogdensburg, near West Camden, N. Y., passenger train derailed at a washout, the engine going down into a culvert.

16th, on Chesapeake & Ohio, at Kerrville, Tenn., a passenger train ran over a steer, derailing and wrecking engine and 2 cars. Engineer and a man riding on the engine killed, fireman injured.

19th, on Iowa Central, near Rockwell, Ia., passenger train derailed at a washout.

20th, on Peoria, Decatur & Evansville, near Olney, Ill., a freight train derailed over a cow, derailing engine and 6 cars. Conductor and fireman injured.

20th, on Orange Belt road, near Mexico, Fla., a passenger train ran over a cow. The engine was derailed and overturned, killing the engineer.

24th, on Minneapolis, St. Paul & Sault Ste. Marie, near Pennington, Wis., a passenger train ran into a herd of cattle, and the entire train except the rear sleeper was derailed and ditched. Fireman injured.

25th, on Detroit, Grand Haven & Milwaukee, at Grand Rapids, Mich., a passenger train running 20 miles an hour was derailed by a tie which had been maliciously placed across the track, wrecking the engine and killing the fireman.

29th, on Pennsylvania, at North Bend, Pa., a west bound express train ran into some wreckage which had been thrown over from the opposite track, disabling engine and damaging several cars.

UNEXPLAINED.

1st, on New York, Lake Erie & Western, near Dale, N. Y., 12 cars of a Lehigh Valley circus train were derailed and wrecked.

2d, on Southern California, near Burwell, Cal., passenger train derailed.

6th, on Ohio River Railroad, at Clarington, W. Va., a special officers' train, consisting of engine and one car, was derailed near a trestle. The car was tipped off and overturned, falling 20 ft., and being badly wrecked. Five officers (of the Baltimore & Ohio), a brakeman and 2 porters were injured.

6th, on Chicago & Northwestern, near Rockford, Ill., passenger train derailed, the engine going over an embankment, killing the engineer and injuring the fireman. A gang of section men were caught by the toppling engine and 4 of them were killed and 2 injured.

9th, on New York & New England, near Highland Lake, Mass., freight train derailed, injuring engineer and fireman.

9th, on Northern Pacific, at Meeker, Wash., 3 cars of freight train derailed.

11th, on Kansas City, Memphis & Birmingham, near Elyton, Ala., hind truck of sleeping car in a passenger train derailed at a switch.

16th, on St. Louis, Arkansas & Texas, near Tyler, Tex., freight train derailed. A following freight crashed into the caboose of the disabled train, doing considerable damage and injuring a brakeman.

17th, on Western North Carolina, near Melrose, N. C., a coal train, consisting of two engines and twelve cars, became uncontrollable in descending a steep grade, and, attaining a high rate of speed, was derailed and went over an embankment, making a very bad wreck. Three trainmen killed and 5 injured.

17th, on New York & Brooklyn Bridge, at New York end, passenger train derailed at a switch.

22d, on Minneapolis, St. Paul & Sault Ste. Marie, near Rhinelander, Wis., engine and baggage car of passenger train derailed, thrown over an embankment and wrecked. Fireman injured.

24th, on Union Pacific, at Lawrence, Kan., excursion train derailed and 3 cars thrown into the ditch, injuring 7 passengers.

24th, on Central of New Jersey, at Parryville, Pa., coal train derailed and wrecked.

25th, on Chicago & Northwestern, near Racine, Wis., 15 cars of a freight train were derailed and wrecked.

26th, on Alabama Midland, at Josephine, Ala., 5 cars of a freight train were derailed and wrecked, killing 2 brakemen.

26th, on Delaware & Hudson Canal Co.'s road, near Glens Falls, N. Y., passenger train derailed, the engine and several cars running into a lake.

27th, on Pittsburgh, Fort Wayne & Chicago, near Canton, O., engine and 3 cars of freight train derailed and thrown over an embankment. Two trainmen injured.

28th, on Chicago, Rock Island & Pacific, at Joliet, Ill., four rear cars of a passenger train were derailed by a defective or unfastened switch, and the foremost one was thrown upon its side and dragged over a bridge, wrecking it completely. Two passengers killed and seven injured.

30th, on Northern Pacific, near Drummond, Mont., two sleeping cars of passenger train derailed and thrown down an embankment, killing one passenger and injuring a dozen others.

30th, on Philadelphia & Reading, in Philadelphia, several cars of freight train derailed and wrecked.

30th, on Alabama Midland, near Josephine, Ga., freight train derailed and four cars wrecked, killing three trainmen.

OTHER ACCIDENTS.

2d, on New York, Lake Erie & Western, near Lake View, N. J., a locomotive spark set fire to a lot of papers and magazines in the smoking car of a westbound passenger train, doing slight damage.

4th, on Baltimore & Ohio Southwestern, near Martinsville, O., axle of front driving wheel of locomotive of a passenger train running about 50 miles an hour broke at the inner face of the right wheel. Both cylinder heads were knocked out and various parts were broken and bent, but the main rod was not broken, and the wheel was dragged over the sleepers and station platform for three-eighths of a mile. A plank of the platform was thrown over a box car on a side track and struck and injured a man at work there.

16th, on Montana Union, near Butte, Mont., parallel rod of engine of passenger train broke, demolishing one side of the cab, killing the engineer.

18th, on Northern Pacific, near Centralia, Wash., an axle under car of southbound passenger train broke.

24th, on Pennsylvania road, at Jersey City, N. J., a passenger train entering the station was not properly controlled and ran into the buffer blocks with considerable force, knocking them down and tearing up the station platform. Several passengers injured.

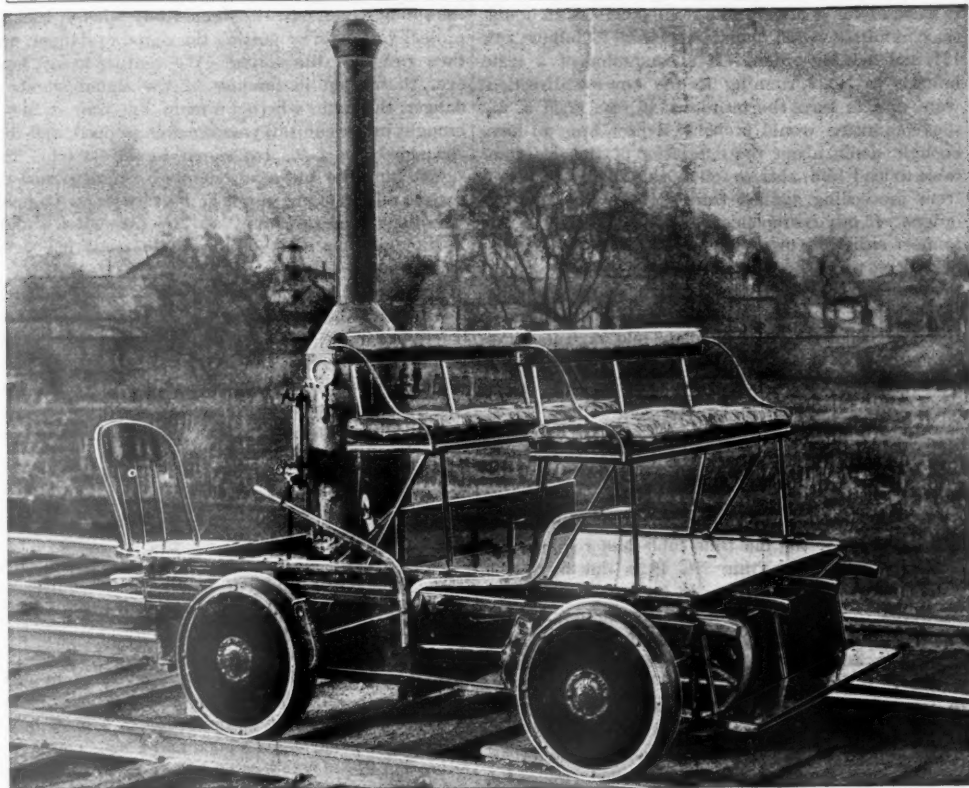
26th, on Kansas City, Memphis & Birmingham, near Townley, Ala., axle under baggage car of a passenger train broke on a trestle.

A summary will be found in another column.

Steam Inspection Car.

The steam inspection car which we illustrate in this issue has the latest improvements of the Kalamazoo Railroad Velocipede & Car Co. It is fitted with a 3½ H. P. boiler and reversible horizontal engine, and carries a 30-gallon water tank. The axles are steel 1½ in. diameter. The wheels are 20-in., of the combination paper and wood type, with steel plates and tires. The frame rests on spiral springs with pedestals. The capacity is six passengers and an engineer. The boiler and engine are set below the main platform of the car, the engine being on a direct line with the driving axle, and the connection is by belt from a 7-in. pulley on the engine shaft to a 16-in. pulley on the driving axle. The weight of the car complete is 1,000 pounds, and it can be run safely at 20 to 25 miles an hour.

The boiler is tubular, and made of a single piece of steel, with vertical seam double riveted; is 42 in. high, 16 in. diameter, with fire box 14 in. diameter, 12 in.



KALAMAZOO STEAM INSPECTION CAR.

high, and containing 37 1/4-in. tubes 26 in. long, making a very large heating surface. It is equipped with modern appliances for convenience and safety.

The engine is of new design, having no cylinder, piston rod, cross-head or ways, but instead has an oscillating piston and rock crank, which transmits the power of the piston direct to the band wheel shaft by a single connecting rod. It is also provided with link motion. The piston is provided with self-adjusting steel packing. The main shaft wrist pins and connecting rod are all of steel. The connecting rod eyes are adjustable, and provided with bushings which can be easily adjusted to the natural wear and secured by a lock nut. The steam chest cover and valve rod guide are cast in one piece, insuring rigidity and perfect alignment. The valve is a balanced slide valve, of new design.

The Pitfalls Into Which Railroad Men Fall Who Write About Railroad Affairs.*

Every writer pays with usurious interest for his shortcomings. I am myself a melancholy illustration of this. The ignorance, inadvertence and haste with which my first books were written have reacted upon me in various ways ever since. I hear myself condemned daily because of them. This is just. To illustrate: I once wrote that I thought the treasurer of a company a better accounting officer than the auditor because of the potentiality of the position of the former. The statement was purely gratuitous, unnecessary, absurd. Its results, sickening to me. I should have said that an accounting officer was good or not, according to his wisdom, adaptability, experience, energy, determination, knowledge of human nature, and the respect paid him in his office. In another place I said there was an irrepressible conflict between the general manager and the accounting officer. This was extremely silly. Awful, in fact. I should have said that wherever we found a man seeking to exercise sole power we were quite likely to find a secret, adroit, insinuating and bitter foe to every one who stood between him and absolutism. This would have been true, would have been in better form, and would not have offended any one, because no one would have believed it applied to him. I should thus have escaped much spite, many unkind speeches, much enmity. However, the usury we pay for our mistakes is sure, sooner or later, to revert to us in one form or another. This in explanation—and apology.

One of the difficulties that those connected with a thing experience in writing about it is to give it due perspective. If too near, they continually find themselves confounding practices with principles, mistaking local makeshifts for essential methods. This is why railroad men who write find it so difficult to separate themselves from particular practices; why their books are so full of special instances. They attach importance to a thing or not just as they are familiar with it or not. Titles to them are exalted or otherwise according to their local environment. They write and speak that which they know.

Practical men find it difficult to write or think about a thing except from their own standpoint. It is only by observation and study that they can overcome this instinct. Railroad men need to overcome it. Above all men they require to be above local superstitions, the antipathies of trade, narrow prejudice, envy, hatred.

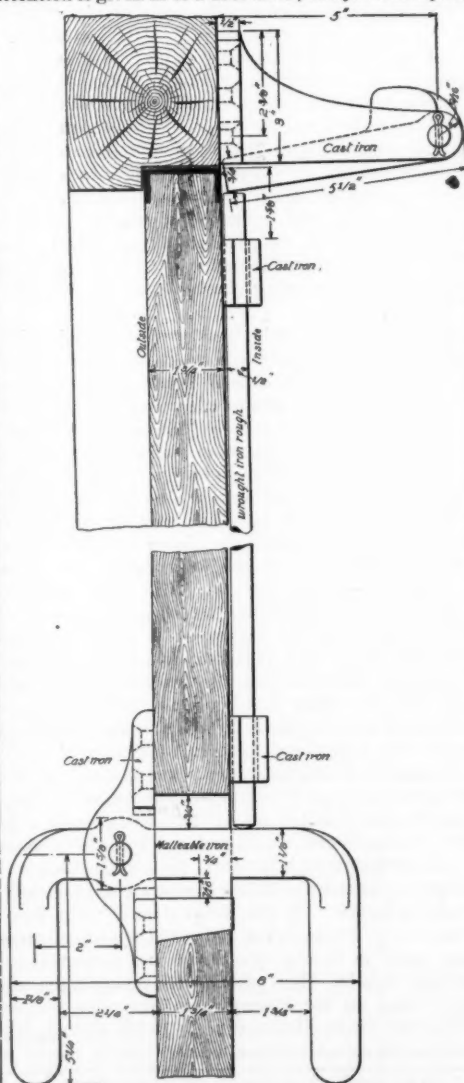
The need of the railroad world to-day is a great college in which its principles and practices may be taught; where corporate administration and its needs may be passionately studied; its philosophy and policy fathomed. A place where the student may for the moment separate himself absolutely from local prejudice, habit and purpose, from the strife for gain, position, power. Where he may distinguish between men and principles, between accident and design, between fundamental methods and makeshifts.

It should be the object of every one who presumes to

write for others to seek to supplement his intelligence by theirs. To induce them to go forward when he stops. To supply his omissions; correct his inaccuracies. In writing a book descriptive of methods and practices, the theories and principles governing must first be explained; afterwards, the rules and regulations may be given; the two must go together. To lay down arbitrary conditions without explaining the principles upon which they are based is to ignore the intelligence of the reader, to seek to guide without enlightening him. It is because of this defect in some of my previous books that I have allowed so many of them to go out of print.

A Novel Door Latch Altoona Shops.

Perhaps there is no detail of a shop to which so little attention is given as to a door latch, and yet it is capable





Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The Southwestern freight rate situation, which has presented a most uniform aspect of gloomy confusion for so many weeks, is now in the hands of a committee which is small and therefore fit for rapid and intelligent work, and which is powerful because it consists of presidents and general managers. The Chicago dispatches still consist largely of generalities, but they seem to indicate two hopeful points: first, that Omaha and other places outside Kansas City have been dropped from consideration and the problem confined to the latter point; and, second, that an agreement has been reached to try to divide the eastbound traffic at Kansas City. Possibly the word "try" may be omitted from this prognostication, but past experience leads us to wait until next week before doing that.

The relative advantages of the 10-wheel and mogul locomotive were discussed at some length at the recent meeting of the Master Mechanics' Association, and while there was a wide difference of opinion as to the advantages of each, yet it was not evident that the differences of opinion were based upon experience with the two types that was detrimental to either. Personal opinion seemed to have more to do with the conclusions reached by the different members than failures of either type in service. No one knew of a case where the mogul engine had been derailed at high speeds, because of the pony truck and several of the members were using moguls to pull the fastest class of passenger train. One argument was offered for the mogul type which clearly points to an advantage decidedly in its favor; it is with reference to the total weight. It was shown that where the character of the permanent way and bridges is such that it is desirable to limit the total weight of the locomotive for the same hauling capacity the ordinary type of mogul is about 20,000 lbs. lighter than the 10-wheeler. This is largely due to the difference in the length of the boiler and to the weight on the truck. The mogul is a shorter engine, and there are several incidental advantages resulting from the decrease in length at the front end, one of which worth mentioning is the decreased length of the main rod, and therefore decreased weight of reciprocating parts. The difference is of considerable moment in high speed engines, being in some cases fully two feet.

A correspondent, F. A. L., sends the following:

Rule 20 of the Standard Code reads as follows: "All regular trains on the road running according to the preceding time table shall, unless otherwise directed, assume the time and rights of trains of corresponding numbers in the new time table." In a certain case the old time table showed train No. 2 due to arrive at the terminus at 0.30 p. m. The new time table figures are the same, and it goes into effect on the first of the month at 12.01 a. m. Train No. 2, of the 31st, meets with an accident 30 miles short of the terminus and is detained until 1 a. m., of the 1st. How shall it proceed to the end of its run? What rights has it under Rule 20? It seems to me that it cannot assume the time and rights of train No. 2 of the new time table without waiting say, until 9 p. m., when the first No. 2 of the new time table is due at the point where it is lying; that it cannot proceed as delayed No. 2 of the old card, because that card expired at 12.01 a. m. But I find a great difference of opinion on the subject and would be glad to have your opinion.

The Time Convention Committee doubtless meant that a train in the situation cited should have its rights for 12 hours after its schedule time, the idea that the old time table had expired, being modified to that extent.

If a conductor of a train like No. 2 should be in doubt, the committee would doubtless tell him to follow rule 121, and ask for orders. If a conductor of a train inferior, to No. 2, running in the opposite direction, were due to leave the terminus at say, 12:30 a. m., the committee would probably expect him to have enough doubt about the expiration of the old time table to lead him, also, to follow rule 121, and refrain from proceeding against train No. 2 without special orders. If our correspondent will try to frame a rule to meet either his own view or that of his opponents, he will, we think, find justification for the position that the committee evidently took, viz: That the train dispatcher should provide for such cases by special orders. But if a road has very inadequate telegraph facilities it may be said that as little as possible should be left for the dispatcher to provide for. Such a road should explain the rule by examples on its own line. For instance, the Wabash, if it had not enough telegraph offices to keep trains moving properly (see page 98 Official Guide for July), might add to rule 20: "They hold their right to the road for twelve hours after their schedule time in the same manner that they would hold it if the old time table had remained in force. For example: Train No. 46 is due in Detroit from East St. Louis at 6:45 p. m. Saturday, and a new time table goes into effect at 12:01 on Sunday. East-bound trains are superior to westbound. No. 46 is 11 hours late, and does not get to Detroit until 5:45 a. m. Sunday. If a train of the same or inferior class is due to leave Detroit at any time between 12:01 and 5:45 Sunday morning it must wait for No. 46." A road which expects to get along without telegraphic orders should try to change its time table at noon instead of midnight.

Distant Switch Signals.

A recent order issued by the New York, Lake Erie & Western brings to mind a common inconsistency in the use of interlocked semaphore signals protecting facing-point switches and crossovers. The order requires that hereafter such signals shall be painted green and the ends cut "fish-tail;" in other words, they will be made caution signals.

Heretofore the practice has been to use a red blade with square end. This is also the practice on the Pennsylvania Railroad,* and was until recently on the Pennsylvania lines west of Pittsburgh; that is, a signal which by its location must be a caution signal is made of the form and color of a positive stop signal. A practice which instructs or even permits an engineer to pass a red semaphore in its danger position violates the fundamental principles of signaling and must be vicious. Such, therefore, we must consider the present Pennsylvania practice with distant switch signals and the former practice of the other two roads mentioned. Of course, there are others in the same box. It goes without saying that the fundamental principle laid down above does not forbid passing a danger signal governing one route when the engine gets a clear signal from a semaphore governing another route, for which it is destined.

On the Pennsylvania lines west of Pittsburgh the distant switch signal was formerly a square end blade of the regular home signal form. Last August the name of it was changed to "auxiliary switch signal," to avoid the confusion of calling two signals of different forms by the same name. The theory was that the auxiliary switch signal would be a stop signal for all trains, and that a train destined for the siding would run under the signal in its clear position, and that the signal would be thrown to the danger position before the switch was opened. In practice it was found that the men did not, and often could not, stop their trains before passing the signal. The signal it must be understood is in its location a distant signal, and is preceded by no caution signal. The men understood that the function of the signal was merely to show whether or not the switch was set for the side track, and if it stood at danger they would run to the switch with the train under control and be governed by the switch target. Last January the name of this signal was again changed to distant switch signal, and it is now a caution signal. The switch target, or better still the semaphore switch signal, is the home signal.

On the Erie a high target on the switch stand is the home signal and the distant signals are to be treated as caution signals. On the Pennsylvania main line, at least on the Pennsylvania Railroad Division, no targets are used at facing point switches protected with distant signals. Here probably the theory is the same as it was on the Pennsylvania lines west, and very likely the practice is the same. That is, the rule is to stop if the signal stands at danger; and if bound for

* On the New York division the distant switch signals are of the old banner form, but trains for the siding run against the red signal.

the siding to run past the signal only when it is clear, protect your rear by putting the signal to danger, and then run into the siding. We venture to say, however, that often in practice, if the signal stands at danger, the train, whether a main line train or not, is brought under control, possibly even stopped, and then run slowly past the red signal to the switch. This signal must be put a considerable distance from the switch, and in many, if not in most, cases an engineer standing under it cannot see how the switch stands. The temptation must be strong to pass the signal whatever the orders.

Again, as this signal is preceded by no other signal, it will often be impossible to see it in time to stop before passing it, in a fog, for instance, or on a stormy night.

We consider it essentially bad practice to put up a stop signal under conditions where it will be used as a caution signal, and still worse practice to issue orders to use it as a caution signal.

The M. C. B. Coupler at Interchange Points.

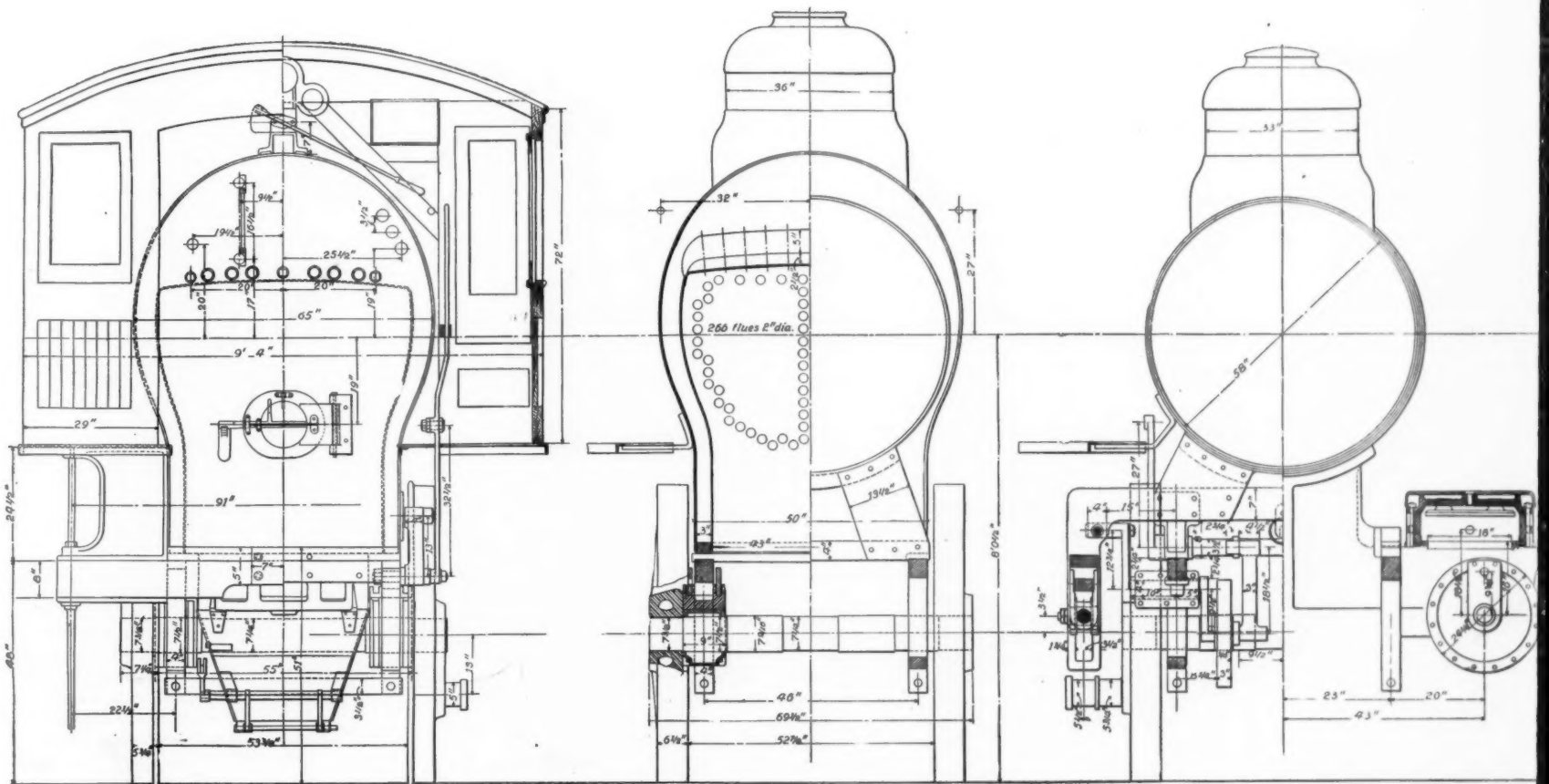
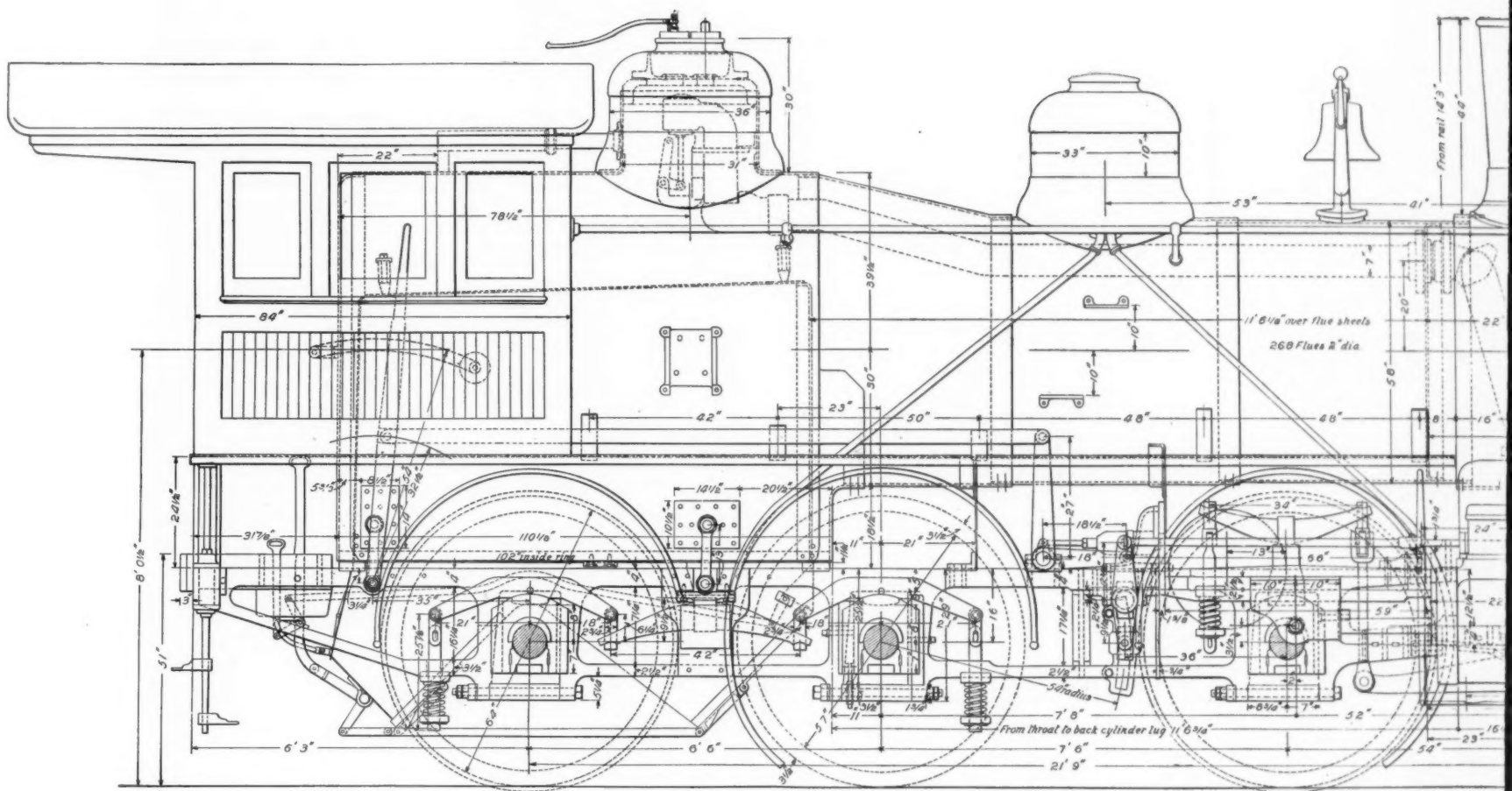
I.

The Master Car Builders' vertical plane coupler has now been sufficiently used to make it worth while to consider its proper treatment at interchange points. On account of the large first cost, and the cost of renewals, it is no small matter to have a few hundred couplers refused at interchange points because of their condition; therefore it is important to know exactly what may be considered a good and a safe coupler, in order that disputes regarding it may be avoided.

It is easy to pass upon or examine these couplers when first received from the manufacturer; all that is necessary is to apply templets made in accordance with the M. C. B. lines. They should conform to such templets within a reasonable variation when first put into service; a variation being necessary in order to bring the cost of manufacture within reasonable limits. If exact accordance with the lines was demanded, that is, within $\frac{1}{16}$ of an inch at all points, the cost of production would be considerably increased, and the knuckles as well as the head would have to be machine finished within the limits of hearing of the templets. Such a course is evidently impracticable. In order then to make these devices at a reasonable cost, it is necessary that castings should be used as they come from the mold, after a reasonable amount of snagging. In the molds or dies both the knuckles and the heads must have a certain amount of "draw"; this results in a configuration at the top or bottom different from that on a horizontal plane through the centre line. A templet which fits at the top and bottom would be too large to pass down through between the knuckle and the head, because of the necessary "draw" on the pattern or die. Here, then, are two causes of variation which can hardly be avoided; one, the unavoidable difference in castings, the other the necessary "draw" on the patterns, molds and dies.

The position of the knuckle with reference to the throat in the drawhead is determined by the position of the pivot and the locking pin. Pivots are usually drilled, and can be accurately placed, but the locking pin is nearly always made rough, as well as the hole which receives it. Here again is an almost unavoidable cause of variation; the location of the locking pin holes cannot always be exactly duplicated in different castings. It is also possible that the shank of the knuckle and the lugs may not have the same angle with each other in all cases. Difference in shrinkage of castings and rough handling while hot render exact duplication in this respect impossible. For the foregoing reasons there should be considerable variation allowable from the M. C. B. lines, even for new couplers. Such variation, however, should not be permitted at vital points, as will hereafter appear.

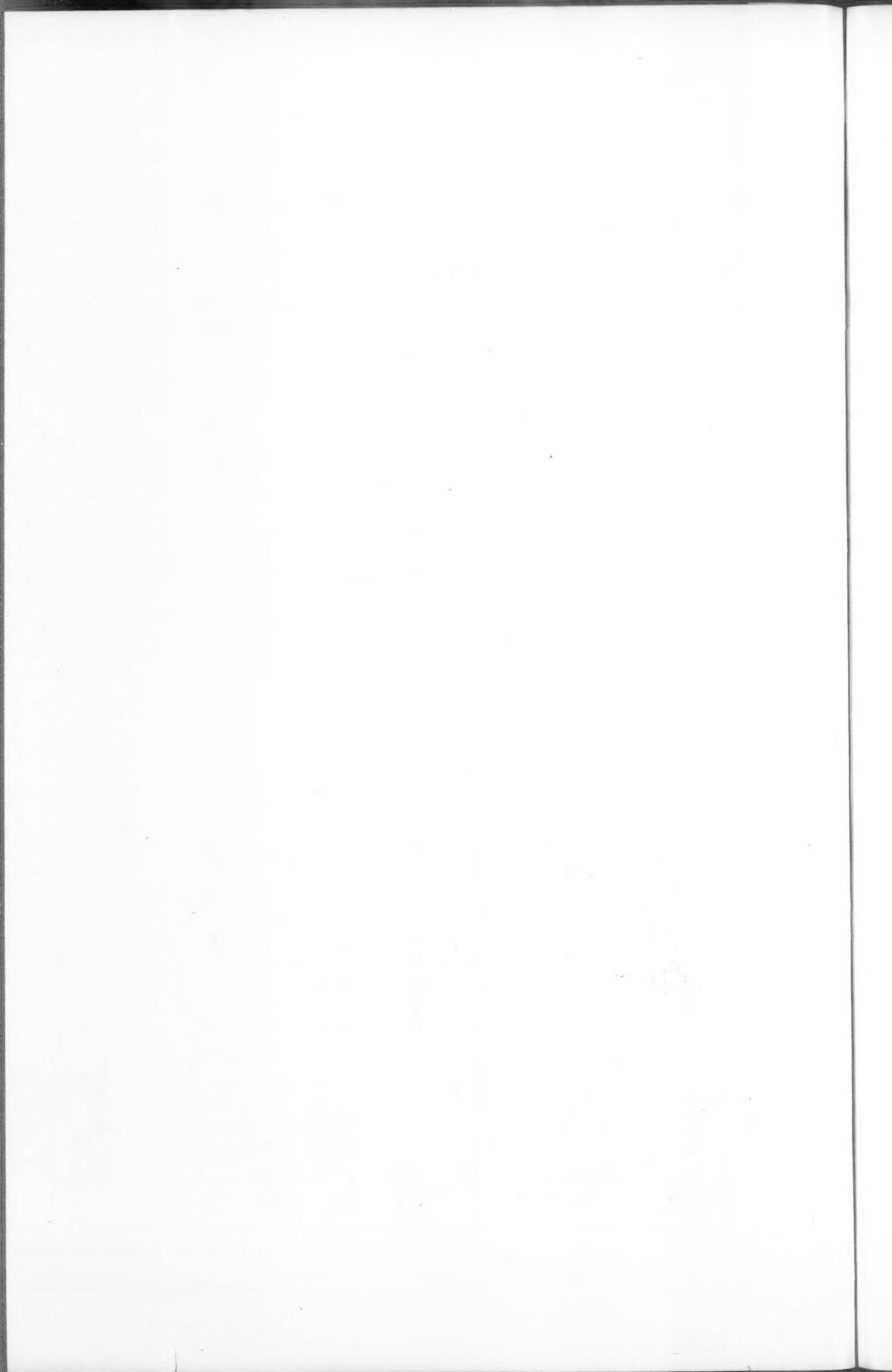
When a coupler is being pulled in a train the knuckle will, under the strain, bend outward because of the springing of the parts and the adjustment thereof to new points of bearing under the strain. This is made evident by the action of couplers when tested in a pulling machine. In some designs the combined bending and readjusting motion is too great to be ignored even in new couplers, therefore the conclusion is reached that in testing such couplers for configuration either a wedge should be driven between the knuckle and the head or a small screw jack or some other force applied to bring the knuckle to a firm bearing and to give it some initial strain before the templet is applied. Manifestly it would be wholly wrong to push the knuckle in to a bearing before applying the templet, because a coupler conforming to the lines when treated in this way might be wholly unsafe to run as soon as a pulling strain was brought on the knuckle.



19 in. X 26 in. MOGUL LOCOMOTIVE, CLASS 19 B.—NEW YORK CENTRAL & HUDSON RIVER RAILROAD.

Built by the BROOKS LOCOMOTIVE WORKS, Dunkirk, N. Y.





Whatever may be demanded of couplers when new, in regard to conformity to the standard lines in other portions, it will be shown hereafter that the location of the inner face of the knuckles ought to be in the exact position called for by the standard contour. This is a point which can be easily regulated by building the couplers a little within the lines and thereafter "easing off" the locking pin or the knuckle shank to allow the inner knuckle face to come outward to the desired position.

Inspection of new couplers for variation from the lines is easy; but with worn couplers the case is different. When first put into service the bearings of all the parts will be on irregularities of surface which wear down after a little service because of the limited bearing and the first $\frac{1}{2}$ of an inch of increased opening of the knuckle, or what is the same thing, increased free slack in the head, is quickly obtained. After that the wear goes on slowly. The grinding away of the interior face of the knuckle, the pivot pin, the shank of the knuckle, and the locking pin, all contribute their quota of the whole wear. In passenger service the wear of the interior face of the knuckle (as recently shown in the *Railroad Gazette*) is more rapid than in freight service because of the continued heavy pressure on the chafing plates and the necessary grinding action between the faces of the knuckle, as the cars move vertically. On the contrary, so far as present experience goes, the



Fig. 1.

wear of the locking pin and shank of the knuckle is greatest in freight service owing to the continual pounding brought about by the slack in the train and the unavoidable endwise oscillations of the cars so peculiar to freight trains. For these and other reasons, couplers soon have an increased amount of free slack; the knuckles open further and the ends are thinner. No one will dispute that there is a limit to the amount of wear and free slack which can be permitted, and it is in the determination of this limit that the main problem of the proper treatment of these devices at interchange points consists. If the limit be made too low, then the loss to railroads in discarded heads, knuckles and pins will be large because of the expense of these parts. On the other hand, if the limit be made too great, then the danger of the train parting will be greatly increased, and the incident cost might exceed the expense resulting from a low limit of maximum wear.

The maximum limit of wear has been estimated by various persons in amounts varying from $\frac{3}{8}$ to $\frac{1}{2}$ of an inch difference in the positions of the interior face of the knuckle after wear and when conforming to the Master Car Builders' lines. We are not without records from experience regarding this matter. Probably the most striking is that of the Santa Fe road, which had about 3,000 couplers in use, the knuckles of which opened soon after being put into service because of the rapid wear of the locking pins and knuckles where they had bearing against the pins. It is true that those couplers were not quite up to the Master Car Builders' lines, yet the case answers for illustration just as well because the difference is one of degree and not of kind. All couplers of whatever form or lines will get into a similar condition after having been a sufficiently long time in service, and the difficulty arises and needs consideration just as much for the Master Car Builders lines as for any other. In fact,

couplers of the standard contour too much worn to be safe in service are now to be found on freight cars, and their number will be increased according as the coupler is more extensively used.

On the Santa Fe the experience was that the couplers would pull apart after the knuckles had opened

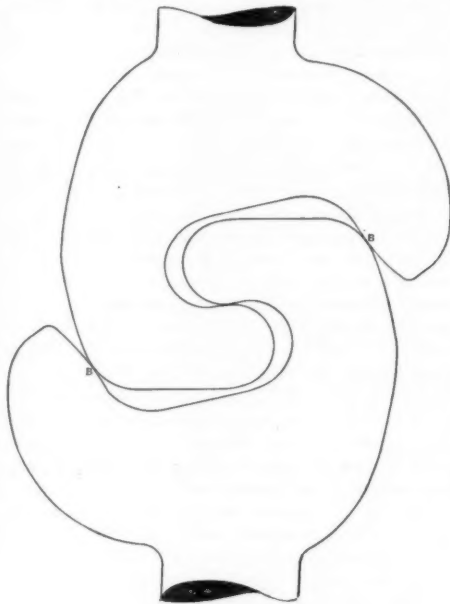


Fig. 2.

three-eighths of an inch, but the limit with the Master Car Builders' line is greater than this, the increase being due to a better contour. On the Santa Fe, as soon as the opening had been increased by the above mentioned distance, the wedging action of the knuckle, hereinafter explained, and which is true of all vertical plane couplers, did materially increase the strain on the knuckle above that due simply to the pull of the train. This increased pressure materially affected the wear of the lock, and as a result it was observed that the greater the opening of the knuckle the more rapid was the wear, and also the greater the increase of opening for the same amount of service. When the couplers reached the condition just described, it was a common occurrence to see two cars couple together without the knuckles being unlocked when they were brought together with considerable force; thus showing that with the amount of wear then existing the train would be liable to pull apart under a heavy stress. This coupling without unlocking will occur with any design of coupler after being sufficiently worn, but it will take place only after greater wear in the case of the M. C. B. lines than with any other contour yet proposed.

In order to illustrate with greater clearness what we

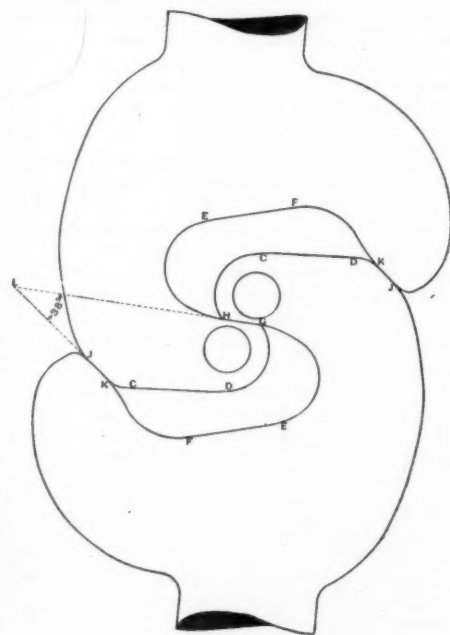


Fig. 3.

have said and to point out other features incident to couplers in service, diagrams are here given which show the condition after certain amounts of wear or from imperfection of manufacture.

In fig. 1 are shown the lines of two M. C. B. standard couplers as they are designed to run. The reversed curves at A are intended to hook into each other and

to hold the couplers in the position shown. Difficulties in manufacture have to a great degree tended to make the actual inner line of the hook straighter than the theoretical line, and to lessen the hooking effect which was intended. This, together with the lateral motion in the stirrup and car trucks, permits the couplers to assume the position shown in fig. 2, and this is the position in which new couplers are found to run, particularly after a little service, as is proved by the wear which takes place on the guard arm at B. After continued service, during which the knuckles have worn on their inner face $\frac{1}{2}$ in., and the guard arm has also been somewhat worn, the position of two couplers will be as shown by fig. 3, in which it will be seen that there is, between the lines C'D and E'F', about $1\frac{1}{2}$ in. of free slack. In a freight train this amount of free slack permits the cars to oscillate endwise, and that is what gives rise to much of the wear of the lock mentioned before.

In fig. 3 the wedging action previously referred to in the case of the Santa Fe couplers can be illustrated by continuing the lines G'H and J'K until they intersect at L. The angle of these lines represents the angle of a wedge to which the bearing surfaces of the knuckle are equivalent. The angle in this case is about 38 degrees. This position represents the condition after $\frac{1}{2}$ in wear, and we do not say whether or not this is a correct maximum allowable wear.

Supposing that owing to improper inspection when

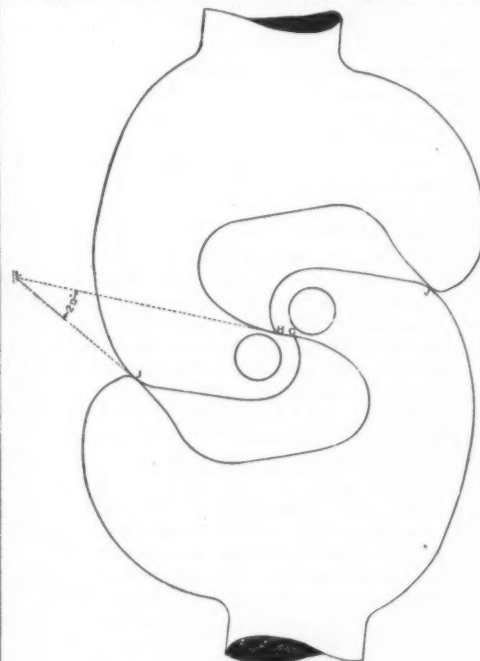


Fig. 4.

first put into service the knuckle was $\frac{1}{2}$ of an inch out of its proper position, and that during the period of $\frac{1}{2}$ in. wear of the knuckle the lock should have worn away sufficiently to allow the knuckle to open $\frac{1}{2}$ of an inch (figures well within the limit of possibility, and too small for some designs), then under these conditions fig. 4 shows the position of the couplers with reference to each other. The lines L'H'G' and L'J' represent the angle of the equivalent wedge, which in this case is about 29 degrees. The condition here shown is worse than that under which the couplers on the Santa Fe parted, and is one which is highly dangerous. The maximum limit to be allowed at interchange points must be considerably less than here shown.

Just what will determine this limit, it is not easy to see. At present it looks as if the best way to do would be to put some well-worn couplers in a pulling machine, and from the results determine how much wear is safe. Roads are now calling for links to stand 95,000 lbs. The couplers in use will stand little over 85,000 lbs. when new. In the condition shown by fig. 4, they would not stand 30,000 lbs. The limit of wear should be determined by the resistance to a direct pulling strain, probably, and after tests of well worn couplers have been made more can be said upon this point, but until that time talk must be necessarily speculative.

TO BE CONCLUDED.

The American Train-Dispatching System.

The record of accidents for June, summarized on a following page, includes an ugly variety of casualties, perhaps a little uglier than the average month shows. There are six different cases in which one or more passengers were killed in passenger trains; two of these have to be set down as unexplained, although the de-

railment at Joliet, Ill., on the 28th, doubtless resulted from causes which are susceptible of some explanation if carefully inquired into. The derailment at Nevada, Mo., on the same day, is attributed to spreading of rails, though, as is well known, this is a vague term often used in explaining the cause of train accidents which, in fact, resulted from something else. We note, however, that one passenger train accident in this month's record is attributed by the superintendent of the road to "spreading of rails," which would seem to indicate that that cause does sometimes operate at other places than on side tracks. The worst accident of the month, however, was that at Warrenton, Mo., on the 9th, where eight passengers were killed, but not in a passenger train. We made a brief note of that accident in our issue of June 13, touching upon the necessity of more care in handling freight trains in which passengers are carried. This trainload of horses was running as the second section of a passenger train, and the cars were equipped with air brakes. In view of these facts it may be well said that this train was nearly on a par with passenger trains, and a correspondent, arguing on this line, has criticised our editorial. He says that the operator would have made the same blunder had this been a regular passenger train, and that there is, therefore, no way in which the road could have bettered its service in this instance.

It is true that telegraphic orders are generally handled as carefully, so far as one can judge by anything definite enough to put his finger upon, when they make meeting points for freight trains as if they were for passenger trains. The Wabash is one of the best managed roads as regards its train dispatching department, and we may well believe that its dispatchers never think of relaxing their vigilance on the ground that a freight train is less important than any other train. Nevertheless, it is true that both train and station employes learn, either consciously or unconsciously, from long experience, to give more careful thought to the movements of passenger trains than of freights. Whether they will it or not, the whole tendency of train management inevitably leads men to pay more respect to a high class train than to an inferior one. The views of the Superintendent of Telegraph of this road, as expressed in his address at Niagara Falls last month, wherein he advocated a more rigid enforcement of time-table rules and less dependence on telegraphic orders, tend to confirm what we are saying. If the operator and others interested knew that this train was actually a freight train, though running on a passenger schedule, they might unconsciously treat it in a manner different from that which they would employ if they were fully aware that it was loaded with passengers. We state this, however, merely as a general principle; we have not learned the particulars of this operator's blunder, and do not say that the principle has an application in his case. As a general truth, however, it will hardly be questioned. The coroner's jury say that "the testimony points to the error as having been committed at Montgomery City, . . . but there was an [atmospheric] electrical disturbance interfering with the working of the wires," and they decide that there was no criminal negligence or carelessness.

Our opinion that freight trains carrying passengers should be handled with more care rests, however, on a more specific basis. There are two features in which the lives of these eight passengers might have been more fully protected. First, the cars might have been stronger and better calculated to resist collision, and, second, some sort of block system might have been used. It may be said that these are extreme measures to be demanded for freight trains; and it must be admitted that they would be unusual in this country; but what are we to do? Must we acknowledge that a train load of horses cannot be transported over a road with less than 25 men to care for them, and that occasionally a third of these men must be killed? Clearly, no superintendent who looks to his own reputation, to say nothing of his feelings of humanity, in view of the sufferings of the victims, can pretend to be guided by such mere "expediency;" it would be throwing the responsibility upon the law of chances with a vengeance. The rational position to take is that of providing unbreakable cars, but if we cannot economically make our horse-carrying cars as strong as sleeping cars, we have two alternatives—either keep the men out of them, or else put a dozen freight cars in front of them. Running the train very slowly might perhaps be regarded as a substitute for the latter. As long as we have 160 butting collisions per year on our 160,000 miles of road—and that is a very moderate estimate—it is no more than fair to seriously consider one or the other of these provisions. "Unbreakable cars," may sound

like a strong term, but all familiar with the effects of severe collisions, and with the difference in these effects on a well-built sleeping car of 1890, as compared with the complete wrecking so often suffered by old cars (too many of which are still running), will agree that the word may very properly be used in comparing the best possible constructions with the long and somewhat slender cars so commonly used for bulky freight, like horses. To carry human live stock in such cars, and at the front of a train, unless there is a pressing necessity for it, is under all circumstances incurring a needless risk, and when a Warrenton collision happens *on your own road*, it stands out vividly as actual recklessness. And whether the cars be strong or weak it is to be remembered that the long settled custom of making up mixed trains with the passenger cars at the rear is based on good common sense, and is a rule not to be lightly set aside. The practice of carrying passengers (in passenger trains) next to the engine, which has been increasing the last few years, certainly is not justified, except where the signal arrangements, the strength of the cars, and all the numerous elements that combine to insure safety conform to the highest standard; and we are not sure but that something may happen to weaken the general faith in that method of making up trains, even where the conditions are all favorable.

But let us consider the position of those who say that light cars are not objectionable. It is not without some reasonable basis. Lightly built vehicles, even for passenger trains, are common in England, and the English kill fewer passengers than we do. We must then look to prevention of collisions instead of sitting down and attributing them to the Act of God and so to be regarded as inevitable; and we must at once admit that the obvious means of securing safety is the same here as there, the block system. On double track lines we may say that this is already admitted, and that all progressive American managers are ready to use the block system as soon as they can get the necessary money; but with single track lines it is not so, and we are placing our whole dependence for safety from butting collisions upon a system whose loop-holes are shown up in a variety of ways every month. Sixty-six collisions in our record during the past year are attributed to mistakes in giving or understanding telegraphic orders, and an equal or greater number of those classed under Miscellaneous and Unexplained could doubtless be added to these if we knew all the facts. Young and inexperienced operators, conductors who will not consult engineers, and engineers who will not consult conductors, occasional unfaithful employes in all classes—one man or another, in some way or other, contrives to produce a collision somewhere every few days, in spite of the excellences of our duplicate-order system. It is true that with better trained men this bad record could be vastly improved, but if we cannot improve our training faster than we have hitherto done, it is high time that some other remedy be sought. The question, squarely put, is: Does the American system of train dispatching, with dispatchers, operators and trainmen as they are, adequately protect the lives of the people who ride on the trains?

As long as there is any loss of life or limb the system under which the casualties occur may fairly be questioned, and in one sense this question answers itself. But whether it does or does not, the comparative immunity from collisions under the staff and tablet systems in Great Britain gives pertinence to the inquiry whether those systems do not afford elements of security which American roads would do well to make use of. The staff system is simply the block system applied to trains moving in opposite directions. It has been successfully used for many years, and the principal objection to it is that it may cause numerous stoppages of trains that would otherwise be unnecessary and that it involves other delays. Especially on our American roads where there are many meeting places between stations, and where side tracks are often inconveniently located, it is believed by many that the clumsiness of the methods employed is so great that it is preferable to continue to depend upon the time table and the telegraph. But admitting this to be so, we simply come back to the main question, whether the better facility and greater danger of our present system ought not to be exchanged for the slower but surer methods of the English. Perhaps we could change them to fast and sure; English practice is not beyond improvement.

We have no new arguments to offer, and, indeed, there are none, for it is essentially a question between security of life and saving of time; if we are far-sighted enough we can ignore the financial question. That better protection of life should be constantly striven for and that true business economy is not antagonistic to this, has

been stated in these columns over and over, and the reader can balance the arguments himself; but there are three or four points giving definiteness to the discussion which we will briefly rehearse.

1. The block system as applied to single track working, either by means of the train staff or otherwise, is as simple in principle and as perfectly adapted to its purpose as it is when used on double track, though the evils to be cured are of a different nature. On a crooked road we may say that practically there can never be absolute safety for trains running in the same direction without a block system, because the contingencies of varying speeds, delinquencies of flagmen and faults of watches, or of the men who carry them, are such that at least a small percentage of risk always remains. These are the reasons why a block system is the only rational method of securing absolute safety to trains running in the same direction. Disaster to trains running toward each other comes from a different class of errors; but yet their nature is such that all our present methods of preventing them are still liable to occasional failure. Forgetfulness by engineers, mistakes of operators and the other familiar causes incident to our present system are causes which are, in a large measure, removable, and yet the "personal equation" remains so much larger than in a block system that we must still regard anything less perfect than that as unsatisfactory.

2. Although with perfect discipline and by carefully following the teachings of experience it seems likely that under our present systems butting collisions can be more surely prevented than can rear collisions, it is to be remembered that the former when they do occur are more likely to be disastrous. Two trains running in the same direction have many chances of getting farther apart instead of coming closer together, and an impending collision may often be averted by alertness on the part of the trainmen; but two trains running toward each other are inevitably rushing toward destruction when any link in the scheme of protection fails.

3. As in double-track working, so in single track, we have automatic devices, as well as those operated by human agency. The staff system on single track may, for our present purpose, be classed with the simple non-automatic block system for double track, but automatic systems are adapted to both double and single track working, and that by a change which is by no means intricate or involved. Both the Union Switch & Signal Company's track circuit and the Hall Signal Company's wire circuit automatic block systems are as perfectly adapted to single track working as to double. In fact, we believe the Hall signal is actually in use for this purpose on a short piece of the New York, New Haven & Hartford, and that it has given highly satisfactory service in that field. Readers will recollect that we mentioned in our issue of Nov. 1, 1889, the Webb & Thompson device for eliminating all unnecessary delays in operating the staff system, and for making it a block system in both directions. It is true that a system wholly automatic is not desirable for single track working, because, like a staff system when worked by men without intelligence, the automatic system cannot distinguish between a first class train and a second class, and so will act on the principle of first come first served in admitting trains to a section, regardless of their relative importance. But the operation of an automatic block system for single track, under the direction either of an operator for each section or of a dispatcher who shall have control of several sections, is as simple and as desirable in the interests of safety, as the operation of an ordinary non-automatic double-track block with the Sykes system. That is, the automatic feature of the single-track block apparatus provides against errors of attendants in the same way that the Sykes apparatus provides against such errors in its field.

In view of all the foregoing, thoughtful American railroad men must admit that mistakes, collisions and deaths continue to occur, and that the causes of these disasters are of a kind which managers have not been able to eliminate with satisfactory success. We must at the same time bear in mind that the exigencies of competition and other forces tending to keep revenues at a minimum preclude the improvement of the service in the line of elevating the personnel as fast as is to be desired. Strongly built cars have mitigated the severity of many collisions, and may be said in that sense to have saved many lives; but we must go beyond that argument and seek to prevent collisions, instead of merely ameliorating their results. To eliminate the personal equation we must make a change in the system, and such elimination is absolutely necessary if we look to the preservation of life and limb rather than to the interests of mere business expediency.

June Accidents.

Our record of train accidents in June, given in this number, includes 64 collisions, 67 derailments and 6 other accidents, a total of 137 accidents, in which 58 persons were killed and 253 injured.

These accidents are classified as follows:

COLLISIONS:		
Rear.....	29	
Butting.....	20	
Crossing and miscellaneous.....	15	64
DERAILMENTS:		
Loose or spread rail.....	4	
Broken bridge.....	2	
Defective switch.....	1	
Broken wheel.....	4	
Broken axle.....	6	
Broken truck.....	3	
Broken car.....	1	
Broken drawbar.....	1	
Broken parallel rod.....	1	
Misplaced switch.....	5	
Careless running.....	5	
Cattle on track.....	7	
Washout.....	1	
Malicious obstruction.....	1	
Accidental obstruction.....	1	
Purposely misplaced switch.....	2	
Unexplained.....	21	67
OTHER ACCIDENTS:		
Broken parallel or connecting rod.....	1	
Miscellaneous.....	5	6
Total number of accidents.....	137	

The causes of collisions, where given, were as follows:

	Rear.	But- Crossing ting. and other.	Tot.
Trains breaking in two.....	2	2	4
Misplaced switch.....	3	1	4
Failure to give or observe signal.....	1	1	2
Mistake in giving or understand- ing orders.....	4	1	5
Miscellaneous.....	10	1	11
Unexplained.....	13	13	26
Total.....	29	20	49

A general classification shows:

	Col- lisions.	Derail- ments.	Other.	Total.	P. c.
Defects of road.....	7	7	7	21	6
Defects of equipment.....	2	16	4	22	16
Negligence in operating.....	28	7	2	37	25
Unforeseen obstructions.....	16	1	1	18	13
Unexplained.....	34	21	1	56	40
Total.....	64	67	6	137	100

The number of trains involved is as follows:

	Col- lisions.	Derail- ments.	Other.	Total.	P. c.
Passenger.....	27	32	6	65	32
Freight and other.....	103	35	1	139	68
Total.....	130	67	6	203	100

The casualties may be divided as follows:

	Col- lisions.	Derail- ments.	Other.	Total.
KILLED.				
Employés.....	11	29	1	41
Passengers.....	9	5	1	15
Others.....	1	2	1	4
Total.....	21	36	3	60
INJURED.				
Employés.....	65	33	3	101
Passengers.....	44	106	3	153
Others.....	1	1	1	3
Total.....	109	140	7	256

The casualties to passengers and employés, when divided according to classes of causes, appear as follows:

	Pass. killed.	Pass. injured.	Emp. killed.	Emp. injured.
Defects of road.....	1	49	5	1
Defects of equipment.....	1	21	5	1
Negligence in operating.....	9	47	14	77
Unforeseen obstructions and maliciousness.....	3	33	4	5
Unexplained.....	14	153	41	98
Total.....	29	203	68	182

Thirty-two accidents caused the death of one or more persons each, and 44 caused injury but not death, leaving 61 (45 per cent. of the whole) which caused no personal injury worthy of record.

The comparison with June of previous years shows:

	1890.	1889.	1888.	1887.
Rear collisions.....	29	15	33	26
Butting.....	20	11	23	12
Crossing and other col- lisions.....	15	7	8	5
Derailments.....	67	42	76	42
Other accidents.....	6	4	3	3
Total.....	137	79	143	88
Employés killed.....	41	18	30	13
Others.....	17	17	10	3
Employés injured.....	98	49	67	37
Others.....	155	53	58	63
Passenger trains involved.....	65	36	51	32
Average per day:				
Accidents.....	4.57	2.63	4.76	2.93
Killed.....	1.93	1.17	1.33	0.53
Injured.....	8.43	3.40	4.17	3.33
Average per accident:				
Killed.....	0.423	0.143	0.280	0.182
Injured.....	1.847	1.291	0.874	1.136

The record of passengers killed is large this month. The worst accident was that at Warrenton, Mo., which is discussed in another column. This collision happened in the night instead of in the day time, as stated in the first report. Another bad collision from an error in orders was that at Busch, Ia., which is laid at the dispatcher's door. The only accident killing a passenger which the reports leave entirely unexplained was that at Drummond, Mont., on the 30th. The unusual case at Childs, Md., where a broken side-rod derailed the rear part of a long train, resulted in the death of one of the chief engineers of the road, and he is classed in our record as an employé. Another unusual and severe accident was that at Clarrington, W. Va., on the 6th, where five officers of the Baltimore & Ohio narrowly escaped with their lives. This was reported in the *Railroad Gazette* of June 13. The killing of four sectionmen at Rockford, Ill., on the 5th, was a tragic result which is inevi-

table as long as derailments occur, but which, happily, must by the law of chances be exceedingly rare.

Five or more accidents in this list were really double or triple accidents, one mishap leading to another immediately after. These were at Tyler, Tex., 16th, La Fox, Ill., 16th, Calera, Ala., 22d, Gate City, Ala., 22d, and Masthope, Pa., 27th. We have reported each case in a single paragraph, thinking the convenience of the reader will be promoted thereby more than by classifying them strictly under different departments. The butting collision of passenger trains at Long Island City, on the 3d, is a reminder that facing-point switches without distant signals are not confined to the poorest roads or to remote districts where traffic is thin. It is true that a yard is one of the most inviting fields for scripping the expense account when funds are short, and that passengers are not killed by mishaps of this sort so often as by more serious collisions or other accidents out on the open road; but it is to be remembered that on a line used by thousands of passengers daily a comparatively slight accident harms the reputation of a road more than would a much worse one under other circumstances. The fact that the scene of a collision is sure to be visited by a dozen wide-awake reporters within half an hour after its occurrence is not of a nature to be overlooked, and a road cannot afford to scare regular travelers (not to mention injuring them), whatever may be said about transient customers.

Near Claremont, Ont., on the 17th, an engine carrying men to repair a washout was incautiously run at too high speed and plunged into the creek, drowning five men. At Capetown, Ont., on the 23d, the Atlantic express of the Grand Trunk, consisting of seven cars, was derailed, killing one passenger and injuring a number. On the 18th, at St. Stephen's, N. B., considerable damage was done by a station agent going into a freight car with a lighted lantern and setting fire to gas which had escaped from a gasoline tank.

The New Bill of Lading.

The representative trade bodies of the principal trade centres seem to be stirred up about the terms of the new bill of lading adopted by the railroads and soon to go into effect. In the issue of May 2 we made some comments upon certain stipulations in the new form, such, for example, as those which apparently exempt the carrier in certain cases from almost every kind of loss imaginable. The phrases which we then commented upon are among those objected to by the different Boards of Trade. These merchants naturally object to the great number of clauses, and call attention to the English enactment on the subject as contained in section 7 of the Railway and Canal Traffic Act of 1854: "Every such company shall be liable for the loss of or injury to any . . . goods in the receiving, forwarding or delivering thereof occasioned by neglect or default of such company or its servants, notwithstanding any notice, condition or declaration made contrary thereto or in anywise limiting such liability."

This principle is, of course, applicable to American business, and as we know is in large measure already recognized by our courts; but, as we have before pointed out, the shifting of the burden of proof from the carrier to the shipper by some apparently innocent phrase is one of the most irritating features of disputes about freight contracts, and it is not strange that merchants "kick" on general principles. They know they have a grievance, but they do not take pains to carefully define it.

But other objections of Boards of Trade are not so well taken. A prominent point of their attack is against the provision of the new bill of lading limiting its negotiability to such instances as are expressly so declared. Apparently the boards are as far wrong here as they may be right regarding the extreme exemption clauses. What is it they ask; that all bills of lading shall be negotiable? This, in its true sense, is more than the common law has ever asserted. When we say that a plain bill of lading not made out "to order" is negotiable, we mean that it is so only in a very limited sense. Promissory notes are negotiable in the strict sense since they can pass from hand to hand and because the last owner has all the legal rights of the first. But a plain bill of lading passes title to the property carried only under exceptional circumstances, and even then there is doubt enough to put a cloud over the ownership. Lawyers have invented the term "quasi-negotiable," but the whole matter is one of our well-known law muddles. It would be for the real advantage of both carrier and shipper if the existing uncertainty could be ended. This would be done by the proposed plan of having every bill of lading clearly either one thing or the other.

The matter is complicated by the attempts of legislatures (different in different states, as might be expected) to mend affairs by statute. Thus in New York there is a law which makes all carriers responsible if they deliver any freight, whether under straight consignment or not, without production of the bill of lading; a law impossible of execution of course, because more than half the consignors take out no bill of lading and some not even a receipt. This law is a dead letter from the very necessity of the business, and no New York railroad pays any attention to its provisions, and yet it is on the statute book and may be revived, to some carrier's great possible loss. Again, a

point is made that bills of lading fraudulently obtained to cover property—cotton, we will say—never delivered to the carrier, will be a loss to the innocent holder of the bill of lading for value if made non-negotiable. This will not be the case under the latter form any more than now, for the Supreme Court of the United States has decided that when no property has actually been delivered to the carrier, the bill of lading is *ultra vires*, and therefore void. Indeed, we are not sure that the carriers, by making a distinction clear which now is confused between negotiable and non-negotiable bills, are not laying themselves open to future losses from this very source. If a fraudulent bill of lading is declared by the railroad itself to be legally negotiable, it certainly adds another element to the case.

What is the objection, then, of the shipper of grain to the distinction now sought to be made? It can only be that under certain circumstances he would like to take advantage of the uncertain and quasi-negotiable character of the old form. But granting the right and business need of the grain shipper to sell his shipment en route, it seems but just that the carrier should have notice of his intention. Practically this can only be obtained by notice at the outset through a sharp distinction in form. The railroad has an equitable right to know whether the freight can safely be delivered to the *prima facie* consignee or whether it must first take pains to ascertain the real owner. Put in this way, the dispute in all fairness is entirely in favor of the carrier, and the carriers, as far as negotiability is concerned, can safely rest their case before the public at just this point.

The Austrian Zone Tariff.

The new Austrian zone tariff, called the "Kreutzer" tariff, took effect on the State railroads June 15. The Hungarian tariff we have described and repeatedly discussed within the last year. In the Austrian system the zones are not of equal size, and up to a considerable distance they are smaller than those of Hungary, so that the difference between zone rates and rates per kilometre is not so great. It should be borne in mind that a mileage rate is a "zone" tariff as much as any other, there being a new zone for every mile. The old German mile of 4½ English miles would give zones nearly as large as the first five of the new Austrian tariff.

The foundation of the new Austrian traffic is a charge of one kreutzer for third-class tickets, two for second-class and three for first-class tickets per kilometre by ordinary passenger trains, increased by 50 per cent. for what are called fast trains, which do not always reach and never much exceed a speed of 30 miles an hour. But the rates are applied to zones, the first five of which are from 10 to 10 kilometres, so that a third-class ticket to any point 10 kilometres or less distant, costs 10 kreutzers; to a station 11 to 20 kilometres distant 20 kreutzers, and so on. Following the five smallest zones are two of 15 kilometres, and one of 20 completes the radius of the first 100 kilometres, and four of 25 bring it up to 200, beyond which there is a new zone for every 50 kilometres, so that for 201 to 250 kilometres the charge is 250 kreutzers, third-class, and so on.

The zone rate is not very different from a kilometre rate, especially for long distances. From Vienna to Trieste, for instance, 596 kilometres, it is 600 kreutzers = 1.007 kreutzers per kilometre; from Vienna to Sessana, on the same line, 558 kilometres, it is likewise 600 kreutzers = 1.076 kreutzers per kilometre.

The kreutzer is worth a trifle more than 0.4 cent, and a kreutzer per kilometre is equivalent, very nearly, to 0.645 cent per mile, making the basis of the rates for the three classes and for ordinary and fast trains as follows, in cents per mile:

	First class.	Second class.	Third class.
Ordinary trains.....	0.645	1.290	1.935
Express trains.....	0.967	1.935	2.902

This is a material reduction from the old tariff, which was about 2.75, 4 and 5.50 kreutzers per kilometre for the three classes, respectively, by ordinary trains, with an increase of 20 per cent. for fast trains. The old tariff, however, offered numerous considerable reductions for round-trip and other tickets, so that actually we believe the larger part of the travel has been at less than the regular kilometre rates. Under the zone tariff nearly all these reduced rates disappear, the exceptions being those where the old rates were actually lower than the kreutzer tariff would make them, and confined chiefly to the important suburban traffic of Vienna, and rates for children to and from school and for laborers to and from their work.

The Austrian passenger rates have been higher than those of any other important European country, and there is every reason to expect that the new tariff will cause a very great increase of travel. Since the zone tariff was introduced into Hungary there has been a strong demand for a reduction of the Austrian rates. It will be remembered that the Hungarian zones were interrupted at Budapest. For four florins (\$1.65) you can go third class from any place on the State railroads to Budapest; but if you wish to go through Budapest, you must pay the zone rate to Budapest plus the zone rate from Budapest to the point beyond. For instance, you may ride from Predeal, on the Rumanian border, in the extreme east of Hungary, to Budapest, 761 kilometres (475 miles), for four florins; but if you wish to go from Erked on the same line, 132 kilometres nearer Budapest, through that place to Vienna, or any place beyond Budapest,

you pay four florins to Budapest just the same, and besides, the regular fare to the point beyond, which, to Vienna is likewise four florins, the distance being 278 kilometres. The effect of this has been to make it cheap to go to Budapest, and the result has been to divert to that city a considerable trade which formerly went to Vienna, which was one of the publicly assigned reasons for making the tariff in that form. The Austrians, and especially the Viennese, naturally were unwilling to suffer the loss which the lower rates in Hungary caused them, and they seek to offset it by reducing their own rates.

One would suppose that a reduction should have greater effect in Austria than in Hungary, the great bulk of whose population consists of peasants, while Austria has many towns and a large manufacturing population, much more likely, it would seem, to travel than peasants.

In Austria, as in Hungary, with the introduction of the new tariff the allowance of 55 lbs. of baggage free is abolished, and everything that goes into the baggage car will be charged for at the rate of 0.2 kreutzer per kilometre, per every 10 kilograms, which would make the charge for a trunk weighing 89 to 110 lbs., for 100 miles, 161 kreutzers (65 cents), or on such a trunk from New York to Chicago about \$6.00.

In the discussion on the subject in the Austria Parliament the member of the government in charge of the State railroads said that the fast trains did not yield any profit. A casual observer might be inclined to think that in Germany, as well as in Austria, and possibly in Italy, the fast trains would be much more profitable if there were no extra charge for riding in them. The only trains which are not profitable are those which are not well filled.

There are still some additions to be made to the record of new main line track laid in the first half of the year, already published: 30 miles should be added to the Pennsylvania total; 17 miles to New York; 8 miles to Virginia; 8 miles to North Carolina; 47 miles to Montana; 10 miles to Colorado; 10 miles to South Dakota. The Pacific Short Line has completed 127 miles of track in Nebraska this year to July 15. We have no late report from this company, but probably 50 miles should be added to the total for Nebraska. The new mileage in these states would then be: Pennsylvania, 96; New York, 21; Virginia, 110; North Carolina, 173; Montana, 152; Colorado, 45; South Dakota, 12, and Nebraska, 120. The distribution by groups would be: New England and Middle States, 167; Southern, 1,048; Northern, 138; Southwestern, 328; Northwestern, 206; Pacific, 108. Total in United States, 2,055.

TRADE CATALOGUES.

Roof and Architectural Catalogue, Indiana Bridge Co., Muncie, Ind.—The company, for convenience, publishes this catalogue separately from its catalogue of bridges. It contains diagrams and short descriptions of a number of very good designs of roof trusses adapted for a great variety of structures. Designs are shown also for plate girders and iron fences and railings.

Morton Safety Heating Co.—We have before now described this company's system of storing heat for car heating by the use of porous, non-metallic pipes. The company issues a special circular, calling attention to the applicability of this system for street cars. The offices of the company are 106 E. Saratoga street, Baltimore, Md., and 45 Broadway, New York.

Guide to Geneva.—The Association of Commerce and Industry of Geneva has published an illustrated Guide to Geneva, containing a city map, a short account of Swiss watchmaking, and other industries, educational institutions, etc. The "Guide" may be had free of charge upon application to the *World Travel Gazette*, 321 Broadway, New York.

Massachusetts Grade Crossing Law.

(Continued from page 525.)

road or of the public way shall be changed the decree of the court confirming such decision shall constitute a taking of the specified land or other property. . . . Said taking shall be deemed to be a taking by the city or town if the land is to be used for a public way, or by the railroad company if the land is to be used by the railroad.

Sec. 5. All damages sustained by any person, in his property, by the taking of land for or by the alterations of the grade of, a public way shall primarily be paid by the city or town, and all damages occasioned by the taking of land for the railroad shall primarily be paid by the railroad company; and in case the parties interested cannot agree upon said damages, the city, town, railroad company, or other party, may have the damages determined by a jury at the bar of the superior court for the county.

Sec. 6. After the completion of the work the crossing and its approaches shall be maintained and kept in repair as follows: When the public way crosses the railroad by an overhead bridge, the framework of the bridge and its abutments shall be maintained and kept in repair by the railroad company, and the surface of the bridge and its approaches shall be maintained and kept in repair by the town or city in which the same are situated. When the public way passes under the railroad, the bridge and its abutments shall be maintained and kept in repair by the railroad company, and the public way and its approaches shall be maintained and kept in repair by the town or city in which they are situated.

Sec. 7. The court shall appoint an auditor, who shall

be a disinterested person, not an inhabitant of the city or town in which the crossing is situated, to whom shall from time to time be submitted all accounts of expense, whether incurred by the railroads, city, town, commission, or auditor, who shall audit the same and make report thereon to the court, which auditing when accepted by the court shall be final. . . . Said court shall issue its decrees for payments on the part of railroad corporations, or of the commonwealth, or of the city or town not exceeding their respective proportions determined as aforesaid. . . .

Sec. 8. The superior court, or any justice thereof sitting in equity in any county, shall have jurisdiction to compel compliance with this act. . . .

Sec. 9. If the board of aldermen of a city or the selectmen of a town in which a public way and a railroad cross each other and the board of directors of the railroad company are of opinion that it is necessary for the security and convenience of the public that alterations should be made in such crossing, . . . in the location of the railroad or public way, . . . or in a bridge at such crossing, or that such crossing should be discontinued, . . . and if they agree as to the alterations which should be made, an instrument in writing signed in behalf of a city by the mayor, . . . or in behalf of a town by the chairman of the selectmen, . . . and by the president of the railroad company, . . . specifying the manner and limits within which the alterations shall be made, and by which party the work shall be done, or how it shall be apportioned between the city or town and the railroad company, the general method of construction, the grades for the railroad and the public way or ways, and also what land or other property it is necessary to take, and what portion, if any, of an existing public way is to be discontinued, and how the cost thereof shall be apportioned between the city or town and the railroad company, shall be valid and binding on the city or town and the railroad company respectively, and have the same force and effect as a decree of the court under the provision of this act, provided that the board of railroad commissioners, after notice to all parties interested by advertisement and a public hearing, approve of the alterations set forth in the agreement as necessary for the convenience and security of the public. Said approval by the board shall constitute a taking of the land and other property specified in the agreement as necessary to be taken. . . . The provisions contained in this act relating to the taking of land under a decree of the court and in relation to the recovery of damages, . . . shall apply to the taking of land and damages sustained under an agreement between the city or town and the railroad company made as herein provided. . . . After the completion of the work the crossing and approaches shall be maintained and kept in repair as provided in section six of this act.

If the agreement provides for the abolition of a public grade crossing it shall be the duty of the board of railroad commissioners to keep itself informed of the progress and character of the work and the amounts reasonably expended for work done or for damages, so far as rendered necessary for the abolition of the grade crossing; and for that purpose it may employ any necessary agents, and from time to time, as it may deem proper, shall issue certified statements of the amount legally and properly expended for such abolition of a grade crossing; and the commonwealth shall pay to the parties entitled thereto under the agreement twenty per centum of such expenditure.

Sec. 10. The amount to be paid under the provisions of this act by the commonwealth in any one year (the year beginning with the passage of this act) shall not exceed five hundred thousand dollars, and the total amount to be paid by the commonwealth under the provisions of this act shall not exceed \$5,000,000, and the treasurer and receiver-general of the commonwealth shall pay the amount of cost allotted to the state from any money not otherwise appropriated, and is hereby authorized, when requested by the governor and council so to do, to issue and sell bonds from time to time, under such terms and conditions, and with a sinking fund for their redemption, as shall best promote the welfare of the commonwealth.

Sec. 11. Notice shall be filed by the petitioners with the railroad commissioners of the entry of any petition under the provisions of this act, and in case application shall be made for changes in grade crossings, which will require in the opinion of said commissioners, after an examination of the decision of the commission appointed by the court, a larger expenditure in any one year on the part of the commonwealth than the amount provided for by this act, said railroad commissioners shall have full power to decide which, if any of said pending petitions shall be proceeded with during the year, and no decree shall be entered under any such petition until a certificate is filed thereon by the railroad commissioners, that in their judgment, the expenditure on the part of the commonwealth will not exceed the amount provided for by this act. . . .

TECHNICAL.

Manufacturing and Business.

The Kalamazoo Railroad Velocipede & Car Co., of Kalamazoo, Mich., received an order this week for 50 of the No. 7 velocipedes from Zurich, Switzerland. The company last week shipped 25 push cars and 20 No. 1 steel velocipedes to South America.

Among late orders received by the Industrial Works, of Bay City, Mich., are a pile driver for the Mexican Central, being the duplicate of an order filled not long since for the same company; also a wrecking and construction crane for the Denver & Rio Grande with a capacity for lifting 35 tons; a wrecking crane for the South Carolina road, and a powerful stationary crane for the Illinois Central.

The Morse Twist Drill & Machine Co., of New Bedford, Mass., will erect a brick building, 164 x 35 ft., two or three stories high, and an addition 70 x 40 ft., one story high. The main building will be 30 ft. high, and the addition 18 ft.; and they will be used as a machine and blacksmith shop.

The Moore Manufacturing & Foundry Co., of Milwaukee, Wis., last week delivered a carload of freight car door hangers to the Wells & French Co., of Chicago, for 250 cars for the Milwaukee & Northern. The firm is completing eight double cylinder hoisting engines to be shipped this month in connection with other machinery for handling coal.

C. A. Fish, A. W. Berne, J. W. Adams and others, of New Orleans, have incorporated the Electrical Safety Railway Switch Co. to manufacture electric switches for railroad use.

The plant of the Westinghouse Machine Co. at Pitts-

burgh is being operated night and day. Among recent shipments were one 250 h. p. compound engine to Cincinnati; two 100 h. p. engines to Australia; one 125 h. p. compound engine, and one 150 h. p. engine to Tacoma, Wash.; two 250 h. p. compound engines to Baltimore, and one 250 h. p. compound engine to the East End Electric Light Co. at Pittsburgh. The total sales for June were 79 engines.

The Perry J. Brown Mfg. Co. has been organized at Dallas, Tex., to manufacture a spark arrester.

Washburn & Moen, of Worcester, Mass., have purchased about 60 acres of ground near the Calumet Iron & Steel Co.'s works, between 110th and 114th streets, Chicago, for a site for a branch factory. The plant will cost \$1,000,000, and 1,000 men will possibly be employed.

The Salem Machine & Car Co. has been organized in Virginia, and the following officers elected: President, J. W. T. Allemon, Salem, Va.; Vice-President, M. V. B. Stinson, Concord, N. H.; Treasurer, E. S. Strayer, Salem.

The Berlin Iron Bridge Co., of East Berlin, Conn., has designed and is soon to begin the erection of a new foundry building for the Pratt & Cady Co., of Hartford, Conn. The building will be 250 x 75 ft., with brick side walls. The balance of the building will be entirely of iron. The wings will be each 20 ft. wide and the central portion 35 ft. wide. This will have a 10-ton traveling crane running the entire length of the building.

Iron and Steel.

The Lebanon Iron Co., of Lebanon, Pa., has just put in operation a 12 in. bar mill, built by the Lewis Foundry & Machine Co., of Pittsburgh. It is equipped with two Stubblebine gas heating furnaces, and is placed in a new addition of 100 x 300 ft.

William Tod & Co., of Youngstown, O., have just started a pair of engines of 2,500 h. p. at the rod mill of Carnegie, Phipps & Co., at Beaver Falls, Pa., and they also have under construction a large amount of engine work and special machinery for the Pennsylvania Steel Co. and for the Illinois Steel Co.

The negotiations for the sale of the property of the Mary Pratt Furnace Company, of Birmingham, Ala., to the Pratt Iron, Coal & Railway Company, is said to have been dropped.

Mackintosh, Hemphill & Co. are building for the Radford Crane Iron Company three blooming engines for the new blast furnace being built at Radford, Va. The steam cylinders are 42 in. x 60 in. and the air cylinders 84 in. x 60 in.

The National Forge & Iron Co., of East Chicago, Ind., is building an addition to manufacture muck bar. A separate building will be erected to contain several puddling furnaces and a train of muck rolls.

The Porter Foundry & Machine Co.'s foundry department, including the addition recently erected, has been destroyed by fire. The company will rebuild at once.

The Totten & Hogg Iron & Steel Foundry Co., of Pittsburgh, is enlarging its foundry department by a building 86 x 110 ft. It will contain a 15-ton open-hearth furnace and annealing furnaces; also four hydraulic cranes, two of 15 tons capacity each and two of 5 tons each.

Pintsch Gas Works.

The works recently built by the Safety Car Heating & Lighting Company in Boston is in full operation, supplying gas to the cars of the Boston & Albany, Old Colony and New York & New England railroads. Additional cars are being equipped with the Pintsch light for these roads. The new equipment for the New York, New Haven & Hartford and New York & New England Railroads, New York and Boston trains will also use this light. The works for the Central Railroad of New Jersey at Jersey City is in full operation, furnishing gas to the cars of the Central of New Jersey, and the through New York and Washington trains, and the Pullman cars on this line. The works in Atlanta, Ga., are nearly completed. Rapid progress is being made in the construction of the works in Cincinnati, St. Louis and Denver.

Interlocking.

The Cleveland & Pittsburgh and the Cleveland & Canton will equip the crossing at Newburg, O., with interlocking signals. Within the past eighteen months the New York, Pennsylvania & Ohio has erected interlocking plants at Buchanan, Latimer, Shenango, Youngstown, P. & W. crossing, between Warren and Niles, Ravenna, Pymatuning, Newburg, Martel, drawbridge at Cleveland, Falconer, and Kennedy, and now has under contract apparatus to be placed at Leavittsburg, Creston, Leetonia, Mansfield, Gallon, and Humrod Furnace.

THE SCRAP HEAP.

Notes.

The Pennsylvania has increased the pay of certain employes in the freight department of the United Railroads of New Jersey 10 per cent.

The Kansas City, Fort Scott & Memphis is at work on a new grain elevator at West Memphis. An elevator which had just been completed was burned at that point about a month ago.

At Bushnell, Ill., July 17, the Toledo, Peoria & Western bridge across Spoon River, a large one of two spans, was swept away by a freshet. Many other minor bridges were destroyed.

The striking freight handlers at Toledo still hang together and claim that their strike is not broken, though the roads have secured large forces of men and seem to be moving the freight fairly well.

Five hundred members of the Brotherhood of Locomotive Firemen met in Hartford on Sunday last and held a private and a public meeting. The latter was addressed by the mayor of the city and by Hon. L. S. Coffin.

The passenger conductors on the Pennsylvania have been requested to give a bond in the Guarantee Company of North America for \$500. Heretofore when the conductors gave a personal bond a three-thousand-dollar bond was required.

A despatch from Bloomington says that a number of conductors of the Chicago & Alton have been discharged. "The company has been doing some detective work that has resulted in the conclusion that a number of situations should be at once vacated," says the despatch.

About 150 yardmen of the Chicago, Rock Island & Pacific in Chicago struck last Saturday on account of the discharge of a man. They soon came to their senses,

however, and resumed work, and the newspapers, which have noted the uniform courtesy with which the management of that road has treated its complaining employes, reproach the strikers for having shown a lack of courtesy toward the company.

The Atchison, Topeka & Santa Fe has agreed to abolish the classification of passenger conductors over the entire system; to give uniform pay of \$125 per month without regard to length of service; to pay for time lost by trainmen on account of delays occasioned by anything beyond their control; to pay for time lost where the men are called upon to report for duty and are not sent out at once, and to pay for 100 miles on all runs less than 100.

The complaints of the engineers and firemen on the Cleveland, Cincinnati, Chicago & St. Louis have been amicably settled. Under the new scale passenger engineers and firemen on the old Big Four are advanced to \$3.50 per 100 miles for engineers and 55 per cent. of that amount for firemen. The old Bee Line freight engineers and firemen were granted an advance to \$4 per 100 miles for engineers and 55 per cent. of that rate for firemen.

A Railroad Scheme for Victoria.

The Premier of Victoria, Australia, has introduced in Parliament a bill providing for the construction of upwards of 1,100 miles of railroad, to cost £12,500,000, besides a grant from the treasury of £2,000,000. He said that the scheme was necessary in order to meet the growth of the population, which, as the census proved, was increasing faster than the population of America.

To Lengthen the Piers.

Steps are being taken by the Dock Department of New York for increasing the length of the piers on the North River. A bill passed by the last legislature provides that the existing piers from the Battery to Seventieth street may be extended to the pier line recently established by the United States Government. This will give an increase of from 75 to 165 ft. It will make some of the piers between the Battery and Tenth street over 700 ft. long, and able to accommodate the largest ocean steamers. The chief engineer has been directed to prepare plans showing to what extent each pier may be lengthened. Several companies have already requested the extension of their piers.

To Drive Cattle from the Track.

An ingenious gentleman of Seattle has patented a kind of squirt gun for driving cattle from railroad tracks. A nozzle is attached to the front end of a locomotive boiler, with a handle leading back to the cab. Through this nozzle a stream of hot water and steam is thrown at will, and by means of a handle the runner can direct the stream toward any part of the track in front of the locomotive. Our vigilant contemporary, the *Scientific American*, shows the apparatus in operation. A malignant-looking engine driver is aiming a squirt gun, from a cab which looks like the end of a damaged freight car, and a stream of hot water is scalding the hide off from a drove of Texas steers. We are sorry that our art department cannot do justice to the picture.

Steel Armor Tests.

Competitive tests of armor plates will be begun by a specially appointed Naval Board at the Annapolis proving grounds, Aug. 15. The requirements are that each plate shall be flat and rectangular, 8 ft. high, 6 ft. broad, and 10½ in. thick, the edge being straight and the sharp corners removed. A variation of one-tenth of an inch will be admissible in the thickness of the plate to cover inequalities of manufacture. The firms presenting armor plates will be allowed to bolt them to the backing in their own way, provided the total cross sections of the bolts do not exceed 58 square inches and the total number of bolts do not exceed 12. Five 100-lb. projectiles are to be fired from a six-inch breech-loading rifle against each plate. The coming competitive trials are important in determining which type of armor-plating shall be adopted by the Navy Department.

This same board will also make a series of tests upon some foreign armor plates. There has been purchased from the works in Creusot, France, besides an all-steel plate, a newly invented nickel-steel plate of the same dimensions as the American armor plates. It is probable also that Cammell & Co., of Sheffield, England, will have a compound plate, made of soft iron and faced with steel, for test in competition with the Creusot nickel-steel plate. The tests of these plates will be under similar conditions to those prescribed for the armor-plates of American manufacture.

This Beats the Bishop of North Dakota.

An eight-wheeled railroad church has just been finished at Tiflis, in the factory of the Transcaucasian Railroad Co., for use along the line. It is surmounted by a cross at one end, and at the other there is a handsome belfry with three bells. Beside the church proper it has apartments for the priest. It can comfortably seat 70 persons. The altar was made in St. Petersburg.

LOCOMOTIVE BUILDING.

Two consolidation locomotives built by the Schenectady Works have been on trial as helpers on the New York Central grade near Schenectady. They were built for the East Tennessee, Virginia & Georgia, and weigh 63 tons. One is a simple engine 20 in. x 24 in. The other is a compound with cylinders 24 in. x 20 in. and 29 in. In other respects it is a duplicate of the simple engine.

Baldwin Locomotive Works.

The Baldwin Locomotive Works, of Philadelphia, have recently completed, or are now building, locomotives weighing 150,000 lbs. each for the Northern Pacific, Philadelphia & Reading, Cornwall & Lebanon, Pennsylvania & Northwestern, Central of New Jersey, Chicago, St. Paul, Minneapolis & Omaha, and Wilmington & Northern. The use of these locomotives is rapidly extending, and the only obstacle to their immediate introduction on many roads is the insufficient strength of bridges. Among other orders on which the firm is engaged at present are 30 locomotives for the Manhattan, 32 for the Union Pacific, 27 for the Northern Pacific, 48 for the Denver & Rio Grande, 12 for the Chicago, Rock Island & Pacific, and 20 for the Baltimore & Ohio. Of the latter, three will be high speed passenger locomotives with cylinders 20 x 24 and driving wheels 75 in. diameter. A large proportion of the work in hand is for export. The three locomotives for the railroad from Jaffa to Jerusalem, in Palestine, were shipped on July 16. Three compound express passenger locomotives are building for a broad gauge railroad in Brazil, and one narrow gauge

ten-wheeled compound freight locomotive for the Mexican National.

The orders which the firm has will keep the works fully occupied from five to six months. The great range of work upon which it is employed is indicated by the fact that recently there were being erected at the same time a locomotive with cylinders 3 x 6, weighing in working order about 5,000 lbs., and one with cylinders 22 x 28, weighing about 75 tons, without tender.

CAR BUILDING.

The Ohio Falls Car Co., of Jeffersonville, Ind., was awarded the contract last week for building 1,450 cars for two Southern roads.

The Bloomsburg Car Co., of Bloomsburg, Pa., has received an order for 200 gondola cars for the Zanesville & Ohio River road.

The Pennsylvania & Northwestern has awarded a contract for building 200 coal cars to the Lebanon Manufacturing Co.

The Harrisburg Car Mfg. Co. has the order for 300 gondola cars for the Huntingdon & Broad Top Mountain road.

The East Tennessee, Virginia & Georgia has placed an order for 200 freight cars with Blaine Bros., of Florida.

The Louisville, New Orleans & Texas is reported in the market for 600 freight cars in addition to the lot recently ordered of the Missouri Car & Foundry Co., of St. Louis.

The Berwind-White Coal Mining Co., Philadelphia, has contracted with F. Dundore & Co. for the construction of 250 coal cars. The cars will be built at the works of the Lebanon Manufacturing Co., Lebanon, Pa.

BRIDGE BUILDING.

Buffalo, N. Y.—The contract for the bridge across the Staquada Creek in Buffalo has been let to C. Williams. The contract price is \$23,400.

Cape Breton.—The first four spans of the \$500,000 bridge now in course of construction at the Grand Narrows, Cape Breton, have been floated into position, and the fifth is being built. At the rate of progress made since the work on the superstructure began, the whole bridge will be ready for trains to pass over before the end of August. The total weight of one of these spans is 225 tons. It is remarked as a coincidence that on July 4, 1889, the first stone of the masonry of this bridge was laid, and on the same day a year later the first span of the superstructure was put in position.

Cheyenne, Wyo.—An agreement between the Union Pacific and the city council of Cheyenne has been finally adopted in relation to the stone viaduct which the road has been ordered to build over its tracks through the city. The company undertakes to build the viaduct on the condition that it is repaid \$45,000 of the cost of the structure with interest in five years.

Cincinnati, O.—The plans prepared by the city engineer for the Eighth street viaduct provide for a structure 2,956 ft. long, which it is estimated will cost \$280,000.

It is proposed to rebuild the McMillan street bridge at an expense of about \$35,000.

Dardanelle, Ark.—A pontoon bridge is to be built across the Arkansas River at Dardanelle by the Dardanelle & Russellville Railroad. The structure will be similar to the bridge recently completed at Fort Smith. It will be built by the Kansas City Pontoon Bridge Co., and will probably cost about \$35,000.

Fredericksburg, Va.—The Groton Bridge Co., of Groton, N. Y., has received the contract, at \$23,300, to construct an 18-ft. roadway iron bridge over the Rappahannock River.

Fultonville, N. Y.—The Rochester Bridge Works have been awarded the contract for the superstructure for the bridge over the Erie Canal at Fultonville for \$4,350. The substructure is let at \$3,532 to I. Thomas.

Kansas City, Mo.—J. H. Higley, of Fort Scott, Kan., has been awarded the contract to build the approaches for the bridge being built across the Missouri River by the Kansas City Bridge & Terminal Railway Co., and commonly known as the Winner bridge. It is expected that the work will take from four to six months to complete. It is estimated that 2,600,000 ft. of timber and 40,000 ft. of piling will be used.

Mayfield, S. C.—A. B. Talley will let the contract on July 28 for the construction of a bridge over the South Saluda River.

Memphis, Tenn.—The piers for the bridge across the Mississippi River at Memphis are nearing completion. The iron work is now arriving, and work on the superstructure will soon begin. The two west portal cylinders at West Memphis have been sunk to a depth of 80 ft., and are ready for the concrete filling. The other two piers on the Arkansas side will probably be of masonry. The anchor pier on the Tennessee side is in progress. The foundation will rest 60 ft. below the surface. Pier No. 3 will be floated this week.

Montgomery, Ala.—Bids will be received by the Board of Revenue of Montgomery County, until Aug. 18, for the erection of an iron or lattice bridge over Catoma Creek on the Wier Road. Length of span about 130 ft.

Nashville, Tenn.—The Youngstown Bridge Co., of Youngstown, O., has received the contract at \$13,600 to build a bridge over Stone's River.

Parkersburg, W. Va.—Jolly & Delliker, of Pittsburgh, Pa., who have the contract for the new bridge across the Little Kanawha River at Parkersburg, commenced work last week and are now employing 50 men on the job.

Roanoke, Va.—The Roanoke Gas & Water Co. is receiving bids for the construction of a bridge across Roanoke River.

Rochester, N. Y.—The Common Council will probably soon authorize the erection of a new bridge at Court street. It is estimated that it will cost about \$160,000. It will probably be a riveted plate girder bridge.

Savannah, Ga.—The Central of Georgia has let the contract for a steel 92 ft. counterbalanced drawbridge over the Ogeechee Canal, in Savannah, to Grant Wilkins, of Atlanta.

The Savannah Construction Co. has let the contract for a steel bridge over the Savannah River, near Savannah, with the masonry and foundations to Grant Wilkins, of Atlanta. The bridge is on the South Bound Rail-

road. It will have one draw span of 250 ft., and two fixed spans each of 125 ft. in length.

Topeka, Kan.—At a recent election in Shawnee County, Kan., it was voted to appropriate \$200,000 for building a bridge across the Kansas River at Topeka. The bridge will be used for wagon and street car traffic and will have a 50-ft. roadway.

Washington County, O.—The County Commissioners advertise for bids on four bridges with spans ranging from 50 to 200 ft.

Waxahachie, Tex.—J. C. Woodlief will receive bids until Aug. 1 for the construction of a stone bridge across Roger's Spring branch.

Williamansett, Mass.—The County Commissioners are having plans prepared for the masonry and superstructure for a new iron bridge across the Connecticut River between Holyoke and Williamansett, below the bridge of the Connecticut River Railroad.

Winona, Minn.—The contract for the construction of the new railroad bridge across the Mississippi River at Winona has been let to the Union Bridge Co., of New York, work to be commenced March 1, 1891. The bridge will be used jointly by the Green Bay, Winona & St. Peter, Chicago, Burlington & Northern and the Winona & Northwestern lines. It will be a steel arch bridge, with a draw of 460 ft.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Cincinnati, Hamilton & Dayton, quarterly, 1¼ per cent., payable July 30.

Denver & Rio Grande, 1½ per cent. on the preferred stock, payable Aug. 12.

Rome, Watertown & Ogdensburg, semi-annual, 3 per cent., payable Aug. 15.

Tennessee Coal, Iron & Railway Co., semi-annual, 4 per cent., payable Aug. 1.

Wheeling & Lake Erie, quarterly, 1 per cent. on the preferred stock, payable Aug. 15.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Anniston & Cincinnati, special, Anniston, Ala., July 28, to act upon a proposed consolidation with the Anniston & Atlantic.

Anniston & Montgomery, special, Anniston, Ala., Aug. 2.

Boston, Hoosac Tunnel & Western, annual, Grand Union Hotel, Saratoga Springs, N. Y., Aug. 20.

Troy, Saratoga & Northern, annual, Grand Union Hotel, Saratoga Springs, N. Y., Aug. 20.

Railroad and Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Traveling Passenger Agents' Association* will hold its next annual convention at Buffalo, N. Y., August 19.

The *New England Roadmasters' Association* will hold its eighth annual meeting at Boston, Mass., Aug. 20 and 21.

The *National Association of General Passenger & Ticket Agents* will hold its next semi-annual meeting at Denver, Col., Sept. 17.

The *American Society of Railroad Superintendents* will hold its annual meeting in New York City on the day preceding the fall meeting of the General Time Convention.

The *New England Railroad Club* meets at its rooms in the United States Hotel, Beach street, Boston, on the second Wednesday of each month, except June, July and August.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Phenix Building, Jackson street, Chicago, at 2 p. m. The Club has adjourned until Tuesday, Sept. 16.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, at 7:30 p. m., on the third Thursday in each month.

The *Central Railway Club* meets at the Tift Hotel, Buffalo, the fourth Wednesday of January, March, May, August and October.

The *Northwest Railroad Club* meets on the first Saturday of each month in the St. Paul Union Station at 7:30 p. m.

The *Northwestern Track and Bridge Association* meets on the Saturday following the second Wednesday of each month at 7:30 p. m. in the directors' room of the St. Paul Union station, except in the months of July and August.

The *American Society of Civil Engineers* holds its regular meetings on the first and third Wednesday in each month, at the House of the Society, 127 East Twenty-third street, New York.

The *Boston Society of Civil Engineers* holds its regular meetings at the American House, Boston, at 7:30 p. m. on the third Wednesday in each month. The next meeting will be held the third Wednesday in September.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday in each month.

The *Engineers' Club of St. Louis* holds regular meetings in the club's room, Laclede Building, corner Fourth and Olive streets, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the House of the Club, 1,122 Girard street, Philadelphia.

The *Engineers' Society of Western Pennsylvania* holds regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Penn Building, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at 8 p. m. on the third Thursday of each month at the Club rooms, No. 24 West Fourth street, Cincinnati.

The *Civil Engineers' Club of Cleveland* holds regular meetings on the second Tuesday of each month, at 8:00 p. m. in the Case Library Building, Cleveland. Semi-monthly meetings are held on the fourth Tuesday of the month.

The *Engineers' Club of Kansas City* meets in Room 200, Baird Building, Kansas City, Mo., on the second Monday in each month.

The *Engineering Association of the Southwest* holds regular meetings on the second Thursday evening of each month at 8 o'clock, at the Association headquarters, Nos. 63 and 64 Baxter Court, Nashville, Tenn.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7.30 p. m., on the third Saturday in each month.

The *Civil Engineers' Club of Kansas* holds regular meetings on the first Wednesday in each month at Wichita, Kan.

A Society of Swedish Engineers.

The American Society of Swedish Engineers has been incorporated in the State of New York with the following as trustees: Henry Sellman, Gustave P. Wern, Brooklyn; Arvid Sandgren, New York; Gustaf Leonard Backstrom, Carl Alfred Sundstrom, Philadelphia. The principal place of business is Brooklyn.

PERSONAL.

—Mr. H. H. Trenor, General Manager of the projected Richmond & Chesapeake, died in New York City this week.

—President Charles F. Mayer, of the Baltimore & Ohio, and President E. R. Bacon, of the Baltimore & Ohio Southwestern, sailed for Europe this week.

—Capt. R. T. Devries, formerly Superintendent of the Trans-Ohio division of the Baltimore & Ohio, has been elected Vice-President and General Manager of the Bellaire Nail Co., of Bellaire, O.

—Mr. S. H. Harrington, at present Mechanical Engineer of the Gould Coupler Co., Buffalo, N. Y., has resigned that position, and has accepted a similar one with the Cleveland, Cincinnati, Chicago & St. Louis road, taking effect Aug. 1. Before accepting his position with the Gould Coupler Co., on June 1 last, Mr. Harrington was for several years Mechanical Engineer of the New York, Lake Erie & Western.

—Mr. L. P. Farmer, General Passenger Agent of the New York, Lake Erie & Western, will accept the position of Commissioner of the Trunk Line Association, Passenger Department. The position has been urged upon him with much unanimity and with every assurance of support and co-operation from those most concerned. Mr. Farmer has been three years and a half General Passenger Agent of the Erie road, and during that time the passenger traffic has greatly increased and the train service has been much improved. Doubtless these results are to a considerable degree due to his work. Before taking service with the Erie Mr. Farmer was in the passenger department of the Pennsylvania.

—Maj. Morris S. Belknap, formerly General Manager of the Central of Georgia, dropped dead while riding in a street car in Louisville, Ky., July 19. Maj. Belknap was one of the best-known railroad men in the South. Mr. Belknap was born in New Orleans in August, 1845. He was educated as a civil engineer in Paris and entered the service of the Confederate army during the civil war. He was afterwards connected with the Louisville & Nashville in the engineering department in various capacities. He was also Division Superintendent of that line and of the Vicksburg & Meridian. In January, 1887, he was appointed General Superintendent of the Central of Georgia, and a few months later General Manager. He resigned this latter position last September to become President of a new bank in the City of Mexico.

—Gen. Silas Seymour died in New York City July 18, aged 73 years. Gen. Seymour had a very extensive experience as civil engineer, and built many important engineering structures in this country, including the Portage bridge of the New York, Lake Erie & Western over the Genesee River, the Washington aqueduct, and the Potomac River railroad bridge at Washington. He was twice State Engineer of New York, in 1865 and 1881. During the former term he had charge of the enlargement of the Erie Canal. He was engaged in the military railroad service during the civil war for some time, and was appointed consulting engineer of the Union Pacific in 1864. He resigned this position in 1869, and has since been engaged in railroad engineering in this country and Canada.

ELECTIONS AND APPOINTMENTS.

Addison.—The incorporators and first Board of Directors of this Illinois company are: John L. Backhaus, William E. Leebberg and Louis Stuenkle, of Addison, and H. C. Zettermeister, of Chicago.

Alabama Mineral.—The incorporators are: R. J. Reddie, J. Q. Stanley, W. C. Stuckey, all of Anniston, Ala., and J. A. Nichols, J. E. Edwards, M. E. Butt and George Butler, of Childersburg, Ala.

Baltimore & Ohio.—The following appointments have been made to take effect Aug. 1: L. S. Allen, Assistant General Passenger Agent of the Central Ohio, Straitsville, Lake Erie and Chicago Divisions, with office at Chicago; O. P. McCarty, Assistant General Passenger Agent of the Columbus and Cincinnati Midland and Columbus and Newark Divisions, with office at Cincinnati, O.

Chattanooga & Lookout Mountain.—Wm. T. Ryan, formerly of the Nashville, Tenn., shops of the Nashville, Chattanooga & St. Louis has been appointed Master Mechanic of this road.

Chicago Junction Railways & Union Stock Yards Co.—The directors of the new company are Chauncey M. Depew, New York; John Quincy Adams, Boston; Edward J. Phelps, Burlington, Vt.; William J. Sewell, Camden, N. J.; John Hoey, Hollywood, N. J.; Frederick H. Winston, Chicago; Right Hon. Hugh C. E. Childers, London, Eng.; Francis B. Blake, London; Bernard T. Bosanquet, London; Adolph von Andre, London.

Cleveland, Cincinnati, Chicago & St. Louis.—S. H. Harrington has been appointed Mechanical Engineer with office at Indianapolis, Ind., taking effect July 1.

Duluth, South Shore and Atlantic.—At the annual meeting held at Marquette, Mich., July 17, the following directors were elected: Samuel Thomas, C. S. Brice, J. W. Sterling, Walter Watson, W. A. C. Ervin, Thomas W. Pearsall, of New-York; Sir George Stephen, Sir Donald Smith, William C. Van Horne, of Montreal; F. N. Finney, of St. Paul; and William F. Fitch, of Marquette, Mich. Samuel Thomas was elected President; Calvin S. Brice, Vice-President; Frederick N. Finney, Second Vice-President; Secretary, L. M. Schanz; and Treasurer, W. A. C. Ewen.

East St. Louis, Chester & Grand Tower.—The officers of this company are: E. Dwight Eaton, President; J. T. Dixon, Vice-President; Caleb B. Eaton, Secretary; M. C. Brown, Treasurer; A. L. Bowen, Chief Engineer; Pollard & Gaylor, Attorneys; T. N. Chase, Right of Way Agent.

East Tennessee, Virginia & Georgia.—The jurisdiction of J. J. Griffin, Assistant General Freight Agent, has been extended to Attalla, Ala., Chattanooga, Tenn., via Cohutta, Ga., and Cleveland, Tenn. The jurisdiction of Ray, Knight, Assistant General Freight Agent, has been extended from Atlanta Junction to Mobile, Ala., and Meridian, Miss., including the Brierfield, Blockton & Birmingham, and the Cincinnati, Selma & Mobile. Traffic to and from Chattanooga, and beyond, will be under the control of the Assistant General Freight Agent, over whose division it passes south of Rome.

Findlay & Western.—The incorporators are James A. Bohe, William E. Snyder, E. H. Jones, John Parker and Jacob F. Burket. The principal office is at Findlay, O.

Greenwood.—The directors of this California road are: L. E. White, J. H. Tate, Charles E. Wilson, T. Pollard and E. J. Dodge, all of San Francisco.

Kansas City & Pacific.—A meeting of the stockholders was held in Parsons, Kan., July 16, and R. S. Stevens, H. D. Minck, T. Penfield, C. H. Kimball, E. B. Stevens and Lee Clark were elected directors.

Kansas, Nebraska & Dakota.—The directors are: S. R. Peters, Newton, Kan.; Oliver J. West and W. D. Tourtellott, Vice-Presidents; Charles R. McLain, Treasurer, and W. T. Reed, Kansas City, Kan., Secretary.

Kinzua Hamlock.—The incorporators of this Pennsylvania company are: T. S. Kane, D. J. Broder, D. T. Hall, D. M. Longshore, Tom M. McClellan, J. D. McGowan and J. Davis, all of Kane, Pa.

Lake Shore.—At the annual meeting of the stockholders held at Laconia, N. H., July 16, the following directors were elected: Charles A. Busiel, Laconia; John Kimball, Frank W. Rollins, Concord; Hiram Hill, Manchester; Amos L. Rollins, Alton; Stilson Hutchins, John S. Crane, Gilford. The Board elected Charles A. Busiel President; Frank S. Streeter, Concord, Clerk.

Lancaster & Millersville.—The following are the directors of this new Pennsylvania road: J. C. Hager, Lancaster, President; Samuel Bausman, Michael Reilly, Henry S. Shirk, Jacob M. Frantz, Francis Schroder, Andrew M. Frantz, all of Lancaster; Peter W. Heistand and Jacob H. Landis, of Millersville.

Lehigh & Hudson River.—Frank T. Sayer has been appointed Car Accountant of this company, with office at Warwick, N. Y. All reports of car mileage and communications relative to the car service should be directed to him.

Little Wabash.—The directors of the company met in Clay City, Ill., July 15, and organized by electing the following officers: J. C. McCawley, of Clay City, President; Edward Austin, of Effingham, and Nathaniel Holderby, of Carmi, Vice-Presidents; Israel Mills, of Clay City, Treasurer; N. M. Burns, of Clay City, Secretary.

Lockport & Buffalo.—The annual meeting of the company was held at Lockport, N. Y., last week. The following directors were elected: T. T. Flagler, W. W. Trevor, James Jackson, Jr.; J. Carl Jackson, A. S. Beverly, William Spalding, I. E. Merritt, William Richmond, James Liddle, J. T. Morrison, A. J. Mansfield, John Hodge and W. H. Ransom. The road is leased by the Erie.

Long Island.—W. E. Burroughs having left the services of the New York & Rockaway Beach Co., Henry R. Newkirk, formerly Station Master of the Long Island at Long Island City, has been appointed Superintendent in his stead. Mr. Newkirk's headquarters will be at Rockaway Park.

Louisville, Richmond & Dayton.—The incorporators of this Indiana company are: George L. Danforth, Attila Cox, William Matthews, J. C. Fawcett, Dennis Long, Louisville; S. A. Culbertson, of New Albany, Ind., and R. Ostrander, of Richmond, Ind.

Marietta, Hocking & Northern.—The incorporators are C. O. Hunter, L. C. Newson, George Hanley, Felix A. Jacobs and Charles E. Bedwell. The principal office is at Columbus, O.

Marquette, Houghton & Ontonagon.—R. T. Brennan, W. C. Van Horne, H. W. Cannon, John G. Moore, G. H. Church, Charles H. Johnson, Jr., J. Hugh Peters and Stillman Gray were elected directors last week. John G. Moore was chosen President.

Marquette & Western.—The directors elected at the annual meeting last week are: Grant B. Schley, H. W. Cannon, Simeon Sullivan, Stillman Gray, John W. Morrow, T. N. Scarborough and Samuel Shortridge. G. B. Schley was chosen President.

Norfolk & Western.—The Scioto Valley & New England having been acquired by the Norfolk & Western, it is now operated as the Scioto Valley Division of the Norfolk & Western. The following officers will have their offices at Columbus, O.: Joseph Robinson, Superintendent; R. Castles, Paymaster; C. M. Zink, Auditor, and J. J. Archer, General Freight and Passenger Agent. Purchases of supplies will be made by W. C. De Armond, Purchasing Agent, at Philadelphia.

Northern Pacific Terminal.—The company has elected officers as follows: Henry Failing, President; C. A. Dolph, Vice-President; Joseph Simon, Secretary. General Executive Committee: C. P. Huntington, for the Southern Pacific; Gardner M. Lane, of Boston, for the Union Pacific, and James B. Williams, of New York, for the Northern Pacific.

Pacific Short Line.—Donald McLean, General Manager of the Wyoming & Pacific Improvement Co., has been elected President of the Nebraska & Western, the corporate title of the Nebraska division of the Pacific Short Line. Millard R. Jones, of New York, is the retiring President.

St. Louis, Springfield & Chicago.—The incorporators and first Board of Directors are: Walter I. Pratt, William Black, George W. Lewis, Dennis W. Sullivan and William F. Daley.

South Mississippi.—These directors were elected at a meeting in Natchez, Miss., July 16: Belton Mickel, George M. Govan, J. A. Hoskins, J. S. Solomon and R. H. Thompson, J. S. Solomon, of Meridian, Miss., is Chairman, and J. A. Hoskins, of Brookhaven, Secretary.

RAILROAD CONSTRUCTION.

Incorporations, Surveys, Etc.

Addison.—This company, which filed a charter in Illinois this week, will construct a shore line from the

Chicago, Madison & Northern road at South Addison to Addison, Dupage County. The capital stock is \$5,000.

Alabama Mineral.—Articles of incorporation of the company were filed at Montgomery, Ala., last week. The proposed road is to extend from Childersburg, Talladega County, to Sycamore. The capital stock is fixed at \$100,000.

Albany, Florida & Northern.—King & Hannon are prepared to sublet at Cordele or Louvale, Ga., the clearing, grubbing and grading on the 35 miles of this road between Albany and Cordele, Ga.

Brierfield, Blockton & Birmingham.—About eight miles of the grading between Gurnee and Bessemer, Ala., has been finished, and work on the remaining 10 or 12 miles is progressing. It is expected that track-laying on this branch will begin about Aug. 15. The company hopes to have the road complete and ready for operation to Bessemer in October. The work is heavy, and many deep cuts will be necessary, and this delays the completion of the line. Surveys are being made at Bessemer for an entrance to that town.

Bristol.—O. M. Gallup, of Swanton, Vt., is reported to have been awarded the contract for building this short Vermont road.

Central of Georgia.—A preliminary survey is being made from Troy, Ala., south toward Pensacola, Fla., for a proposed extension of the Mobile & Girard. The surveyors have reached the Conecuh River, six miles south of Troy. Capt. F. Y. Dabney is in charge of the work, with office at Troy.

Choctaw Coal & Railway Co.—The tracklaying on the last few miles to the junction with the St. Louis & San Francisco, on the division between South McAlester and Wister Junction, has been delayed from various causes, so that the line was not opened for traffic as early as was expected. The track on these few miles was laid last week and the connection made with the tracks of the St. Louis & San Francisco. Some tracklaying has also been completed west from South McAlester for some miles, east and west of El Reno, Oklahoma, and elsewhere along the line of the Western Division. Work is now in progress from El Reno to a connection with the Atchison, Topeka & Santa Fe.

Columbia, Newberry & Laurens.—This road has been opened for traffic its entire length, from Columbia to Newberry, S. C., a distance of 43 miles. The division between Columbia and Prosperity, 35 miles, has been in operation for some time.

Denver & Rio Grande.—The Chandler branch of this road, now being built, commences at mile-post 153.87, 1.37 miles west of Florence, Colo. It extends in a westerly and southwesterly direction, to the Western Fuel Co.'s mines. The grading was completed in May and about one mile of track has been laid by the company's force. The bridges are all small and unimportant. The maximum curvature is 10 degrees and the maximum grade is 2.5 per cent.

East St. Louis, Chester & Grand Tower.—B. T. Johnson, of St. Louis, has been awarded the contract for building the first 66 miles of this road between East St. Louis and Grand Tower, Ill. The grading is to be commenced Aug. 10. A. L. Bowen is Chief Engineer.

Empire & Dublin.—The contractor for the extension from Hawkinsville to Grovania, Ga., broke ground at the former town, July 15. A large number of men are being employed.

Evansville & Richmond.—The tracklaying on the extension to Westport, Ind., is progressing rapidly between the Jackson County line and Elizabethtown, Ind., on the Madison branch of the Jeffersonville, Madison & Indianapolis. The line will probably be completed to a connection with the Cleveland, Cincinnati, Chicago & St. Louis at Westport by Aug. 1. The extension of the Cincinnati, Wabash & Michigan from Anderson to Rushville will probably be completed by Aug. 15. The tracks of the Cleveland, Cincinnati, Chicago & St. Louis will be used between Westport and Rushville to connect the two roads.

Fairhaven & Southern.—Most of the grading between Fairhaven, Wash., and New Westminster, B. C., has been completed. The contractors on this work are: James H. Leamy for the line from the Fraser River, opposite New Westminster, to the international boundary line, a distance of 25 miles; McCoy & O'Brien for the remainder of the work to Fairhaven, five miles. On the Skagit River from Sedro east G. Linden has the contract in five-mile sections east, the distance not being defined. The company is now receiving bids for all the work from Sedro south to Seattle, to be completed this year. The grading is finished between the Fraser River and the boundary line, and the contractor is now awaiting the arrival of the rails, which have been on the way since December from Maryport, England. The grade is well under way on McCoy & O'Brien's contract; the only detention in tracklaying to connect Fairhaven with the British boundary is some heavy work on the shore line between Fairhaven and Whatcom, which the company expects to complete within two weeks, when the track will be rapidly laid to the British boundary, the rails now being on hand for that purpose. The grading on the first five miles east from Sedro on the Skagit River is also completed and ready for the track, which will be laid at once. The next division east of this to the coal mines, a distance of five or six miles, is well under way.

The country from Fairhaven, which is located on Beltingham Bay, to New Westminster is a very fine agricultural section, in places heavily timbered with red fir and cedar. The entire distance from Fairhaven south to Seattle is an unbroken belt of valuable timber land, but crossings of the various streams running from the Cascade range into Puget Sound necessitate heavy work for this line almost the entire distance. The line skirts the foot-hills of the Cascade range, through valuable coal fields, with here and there outcroppings of brown hematite iron ore. From Sedro, on the Skagit River, easterly, following the course of the river, the line first crosses a bituminous coal belt, perhaps 12 miles in width, containing veins ranging in thickness from 6 in. to 35 ft. This coal is said to be of an excellent quality. The line now crosses an extensive belt of iron ore, which is perhaps 15 miles in width, and contains veins of brown hematite, some of which are pronounced very valuable for the production of Bessemer steel, there being no phosphorus, and carrying considerable manganese, with an average of over 50 per cent. of metallic iron. Beyond this, still following easterly up the river, the line crosses a limestone formation. There is also in this belt a ledge 300 ft. wide, which has been tested only

locally, but is pronounced a good quality of marble. It takes a fine polish, and has the appearance of Italian marble. As the summit of the Cascade range is approached on the surveyed line of this road there is now being developed some ledges of argentiferous galena, which assays show to contain a large percentage of galena, averaging possibly 90 or 100 ounces in silver. The line is surveyed to Lake Chelan and the Okanogan silver mining region, and the headwaters of the Columbia River, near the mouth of the Okanogan. From this point the route east is an easy one, through the Kootenai country, to Fort Benton, in Montana, through the Marias Pass.

Findlay & Western.—The company has been chartered in Ohio with a capital stock of \$100,000. The purpose of the incorporators is to build a road from Findlay, through Hancock, Putnam and Paulding counties, to a point on the Indiana and Ohio state line, and thence to Fort Wayne, Ind. It is a reorganization of the American Midland.

Forest City & Sioux City.—The tracklaying on this road, between Forest City and Gettysburg, has been completed from Gettysburg, S. D., on the Chicago & Northwestern, to within six miles of Forest City. The distance between these points is about 16 miles, and the grading has been finished for some time.

Gadsden & Montgomery.—A survey for this road is proceeding between Gadsden and Montgomery, Ala.

Georgia Pacific.—The new branch from North Birmingham to Coalburg, Ala., through Hecla and Morrow mines is practically complete. All the track has been laid, but not surfaced. It will not be ready for trains for a week or two. The branch is seven miles long, and its completion gives the Georgia Pacific two lines between North Birmingham and Coalburg. It reaches several large mines.

Great Falls & Canada.—The tracklaying on this road has reached a point about 80 miles north of Great Falls, Mont., and eight miles north of Blackfoot. The road will soon reach the Marias River.

Great Northern.—A press dispatch states that Donald Grant & Co., of Great Falls, Mont., have been awarded the contract for building the Pacific Coast extension of this road from a point near Great Falls.

Greenwood.—Articles of incorporation have been filed in Colorado. The company proposes to build a narrow-gauge road from tide water, at the mouth of Greenwood Creek, to Elk Creek, thence to the main branch of Alder Creek, and to a point near the east line of section 26, in township 16, an estimated distance of 54 miles. There will be a branch from Alder Creek to a point distant about three miles from said creek, the estimated length of the branch being about eight miles. The capital stock of the company is \$500,000, of which \$70,000 has been subscribed.

Indiana.—This company was incorporated in Indiana July 22. Milton Mercer is President; J. C. Caldwell, Vice-President; Edward W. Hawks, Treasurer, and H. V. Mercer, Secretary. The capital stock of the company is \$3,000,000. The projected road will extend through Dekalb, Noble, Elkhart, Kosciusko, Marshall, St. Joseph, Laporte, Porter and Lake counties, and will be about 150 miles long in Indiana.

Kansas, Nebraska & Dakota.—The company filed articles of incorporation in Nebraska, last week. The proposed route is from Newton, Kan., northwesterly through Nebraska to some point in the north of the state thence through the states of North and South Dakota to a point near Devil's Lake, in the latter state. The length of the proposed road is 1,000 miles and the capital stock is \$4,500,000. S. R. Peters, of Newton, Kan., is President.

Kinderhook & Hudson.—Tracklaying on this road was completed July 16, and a passenger train was run over the line that day between Hudson, N. Y., and Niverville, in the town of Kinderhook, a distance of about 17 miles. It connects at both points with the Boston & Albany, and extends through a manufacturing section of Columbia County.

Kinzua Hemlock.—This company has filed a charter in Pennsylvania for a road to extend from Camp Halsey on a branch of the Mount Jewett, Kinzua & Rittville road, about one mile north of Mount Jewett in McKean County to a point on the Kinzua Creek & Kane road near the junction of the north and south branches of Kinzua Creek, a distance of 14 miles. The length of the road will be 14 miles. The capital stock is \$140,000. Thomas S. Kane, of Kane, is President.

Lake Washington Belt.—This company has been incorporated in Washington with a capital stock of \$2,000,000. The road to be built is the belt line around Lake Washington, near Seattle, to be formed by the construction of a branch of the Canadian Pacific.

Lancaster & Milersville.—This company has been incorporated in Pennsylvania to build a road from the State Normal School in Millersville, Lancaster County, Pa., to the west end of the village. The length will be about two-thirds of a mile. The capital stock is \$40,000. John C. Hager, Lancaster, is President.

Leavenworth & St. Joseph.—McArthur Bros., of St. Paul, Minn., have been awarded the contract for building this road. It is to extend from a point on the St. Joseph, St. Louis & Santa Fe, 7½ miles south of St. Joseph, Mo., and thence down Bee Creek, through the towns of Faucett, Dearborn and New Market to Beverly Junction, where connection is made with the Leavenworth branch of the Chicago, Rock Island & Pacific, whose tracks are used to reach the bridge over the Missouri River at Fort Leavenworth. The distance is 23 miles. There are two iron bridges, each about 120 ft. long. The work is light, with little rock cutting. The maximum grades are 26 ft. per mile and the maximum curves 6 degrees. It is expected that the road will be completed in October.

Louisville, New Orleans & Texas.—The Tallhatchie branch has been finished for a distance of 24 miles from Clarksdale, Miss., and will probably be opened for traffic to Minter City, a distance of 40 miles, next month.

Louisville, Richmond & Dayton.—This company, referred to last week, has filed its charter in Indiana for a road from New Albany to Richmond, Ind., and Dayton, O. It will be about 140 miles long. The capital stock is \$4,000,000.

Marietta, Hocking & Northern.—The articles of incorporation were filed in Ohio last week. The company is to build a road from Marietta to Washington Court House, with branches. Also to mine coal and iron. The

principal office is at Columbus. The capital stock is \$100,000.

Mexican Roads.—The following new concessions and modifications of old ones have been made: J. E. Valenzuela for a standard-gauge line from a point between Piedras Negras and Nava on the International to coal mines and to the city of Saragoza. Construction must begin within six months, the entire line to be completed in 18 months. There is no subvention. Fifteen years' exemption from customs dues, federal or local, is granted on construction and operating material.

The concessions granted Dec. 20, 1889, to Gen. Hermenegildo Carrillo for a line from San Juan de los Rios to Teziutlan and also the concession dated June 25, 1887, for a road from Nautla to San Marcos, have been modified and consolidated into a single new concession, which authorizes a narrow gauge line, San Marcos on the Mexican road, through Teziutlan, to the Bara de Nautla on the Gulf of Mexico. A subsidy of \$6,000 per kilometre, payable in 5 per cent. bonds, is granted, and the usual exemption from duties on construction and operating material for 15 years. At the expiration of 90 years the roadbed reverts to the government.

The concession granted May 25, 1887, to Luis Huller, for various lines in Lower California, Sonora and Chihuahua, and by him transferred to the Mexican Land & Colonization Co., has been modified. The lines are now fixed as follows: From San Quintin, through the Valley de la Trinidad, to the Colorado River, with a branch toward the Fuerte Yuma; from the previous line to Tijuana, with a branch to Ensenada, and also, in the opposite direction, from San Quintin to the Bahía de los Angeles; from the Colorado River to a connection at Magdalena with the Sonora by Altar, and with a branch to Port Isabel; from Magdalena to connect with the Mexican Central at Paso del Norte. At the expiration of 90 years the roadbed will revert to the government.

Middle Georgia & Atlantic.—The section from Machen to Eatonton, Ga., is about completed. The heaviest work is at the Little River. The bridge with trestle, is 950 ft. long and 85 ft. high. The iron span is 200 ft. long. The Marshall trestle, near the river, is 53 ft. high and 975 ft. long. G. L. Reeves, of Atlanta, has the contract. Between Machen and Covington the work is being rapidly completed.

Nashville & Knoxville.—The recently completed extension from Buffalo Valley to Cookeville, Tenn., 22 miles, was opened for passenger traffic July 14.

New Roads.—A road is proposed from Warren, through New Edinburgh, to Kingsland, Ark., on the St. Louis, Arkansas & Texas.

Ohio Valley.—There are about 450 men at work on this road between Bellaire and Marietta, O. Several steam shovels are in use on the work.

Orlando & Winter Park.—The extension from Lakemont to Gabriella, Fla., five miles, has been placed in operation. The road is now 11 miles long. The Osceola & Lake Jesup has been completed to Oneida, five miles beyond Gabriella.

Oxford & New Glasgow.—This road was opened last week between Oxford and Pictou, N. S., a distance of about 60 miles. The road will be operated as part of the Intercolonial system.

Pacific Short Line.—The track was laid into O'Neill, Neb., July 14. This completes the line for 127 miles from Sioux City, Ia., west, through northern Nebraska.

Philadelphia & Reading.—Twelve miles of the grading on the New Hope extension of the Northeast Pennsylvania branch has been finished by the contractors, and it is expected that the entire line to New Hope, Pa., on the Delaware River, a distance of 16 miles, will be ready for operation in October.

Philadelphia & Sea Shore.—This line is now completed to within two miles of Sea Isle City, N. J., and the tracks will probably reach that town within ten days. The road is being operated between Winslow Junction and Tuckahoe, 27 miles, by the Philadelphia & Reading under a 25-year traffic contract. Fast passenger trains will soon be put on between Philadelphia and Sea Isle City.

Pittsburgh & Lake Erie.—The new tracks from Pittsburgh to Phillipsburg, Pa., 27 miles, will be ready for use in about two weeks. That part of the new line extending from Phillipsburg to Wampum, 15 miles, will not be ready for six weeks yet. The new track will lessen the distance several miles between Pittsburgh and Youngstown. This is accomplished by over-coming some very steep grades and reducing curves. The route now lies much closer to the Ohio River, and a more picturesque view of the country is obtained. In some instances the grade has been raised five and six feet. This was done between Pittsburgh and Alliquippa. Long trestles have also been put in. The work has been going on over a year, and the improvements are very marked.

Ravenswood, Spencer & Glenville.—At the meeting of the stockholders, held in Ravenswood, W. Va., July 16, it was decided to increase the capital stock to \$250,000. Stanley & Oulds, the contractors for the grading and bridging, commenced work on July 13. It is thought that the first 17 miles can be completed this fall. President William Woodyard has advertised for ties for the entire line.

St. James & Napoleonville.—This company is being organized at New Orleans to build a road through timber lands to the Texas & Pacific at St. James Station. The office of the company is at No. 106 Common street, New Orleans.

St. Louis, Kennett & Southern.—The grading was begun recently near Campbell, Mo., on the section south of that point which has been cleared. It is expected to complete the road to Kennett, in the southern part of Dunklin County, in the fall.

St. Louis, Springfield & Chicago.—The company was chartered in Illinois this week. It proposes to build a road between Springfield and Chicago. The capital stock is \$3,000,000.

Seattle & Northern.—The first 20 mile section of the road has been turned over to the operating department. Regular trains will soon be put on between Anacortes and Wooley junction, a point one mile north of Sedro, Wash. Work is being pushed toward Hamilton, eight miles east of the junction.

Sherman, Denison & Dallas.—Grigsby Bros., of Dallas, Tex., have been awarded the contract for the grading on the line between Denison and Sherman, Tex., about 10 miles.

Shuswap & Okanagan.—About 300 men are working on the northern division of this road and the grading has been completed on the first 10 miles. The company intends to have 600 men at work within a few weeks. Patterson & McStoy, of Enderby, B. C., are the contractors. There is a good deal of rock work on the first 20 miles of the road from Sicamous, on the Canadian Pacific, south, but the rest of the line to Lake Okanagan is easy work in clay and gravel. The entire length of the line is 51 miles, and it is to be operated by the Canadian Pacific for 25 years. The four per cent. bonds of the company are guaranteed by the British Columbia government for 25 years. P. Larkin, of St. Catharines, Ont., is President, and C. Perry, of Victoria, B. C., is Chief Engineer.

Silver City, Pinos Altos & Mogollon.—The first mortgage bonds of the road have, it is reported, been sold in New York, and it is proposed to begin the construction of the line Aug. 1. It will be 70 miles in length, penetrating a rich mineral region.

Southern Pacific.—The reconstruction of the track along the Soledad canyon in Northern California is completed as far south as Hornby, and the grading has been finished for the entire length of the line. In about two weeks' time the remainder of the track will be laid, the culverts will be put in, and trains will then be run over the new line. The cost of the repairs and the temporary work necessitated by the destruction of the old track is estimated at about \$500,000.

A survey is being made from Santa Cruz, Cal., north for a distance of about seven miles to bituminous rock beds, to determine whether there is an available route to that point and whether the line would secure sufficient traffic to pay for its construction.

Union Pacific.—Standard gauge rails have been laid for a distance of 27 miles from McCommon, Idaho, south, alongside of the narrow gauge track. Tracklaying is also in progress from Ogden north to Deweyville, Utah, a distance of 35 miles, where the new location of the line begins. It is expected to have standard gauge trains running over the entire line early in September between Salt Lake City and Butte, Mont. About 1,200 men and 400 teams are reported engaged in the work at present.

West Virginia & Pittsburgh.—The Clarksburg & Weston division has been changed to standard gauge between Weston and Clarksburg, W. Va., on the Baltimore & Ohio, a distance of about 25 miles.

Wheeling Bridge & Terminal Co.—The contractors have completed about 950 ft. of the tunnel under Chapline Hill; of this about 725 ft. are at the north end and 225 ft. at the south end. About 1,500 ft. remain to be excavated, and the work will take about six months to finish. Work at the channel span of the bridge is going on rapidly, and the work will soon be completed.

Winchester.—A line has been surveyed for a road from Hackler's Gap, Tenn., up the Winchester Hollow to a new ore mine.

GENERAL RAILROAD NEWS.

Canadian Pacific.—The issue of additional capital stock of the company is publicly announced to be in the form of \$1,000,000 sterling 4 per cent. perpetual debentures at 97½ per cent. Of this \$720,000 will be applied to the Pacific steamship service and the rest is for rolling stock and betterments. The issue is made by the company direct and not through Baring Brothers, as heretofore.

Central of Georgia.—The earnings and expenses of the system for June were as follows:

	1890.	1889.	Inc. or Dec.
Gross earn.....	\$7,947,394	\$7,044,126	I. \$903,268
Oper. expen.....	5,941,815	4,821,595	I. 1,120,219
Net earn.....	\$2,015,579	\$2,222,530	D. \$206,951
Income from invest.....	175,208	123,341	I. 51,866
Total net income.....	\$2,190,787	\$2,345,872	D. \$155,084
Mileage.....	1,312	1,220	I. 92
Voyages.....	287	267	I. 20

Chicago Junction Railways & Union Stock Yards Co.—The prospectus of the company was published last Saturday, and the books opened for subscriptions simultaneously in New York, Boston, Chicago, London and Amsterdam on Monday. The capital stock of the new corporation, which is chartered under the laws of New Jersey, is \$13,000,000. The new corporation acquires 98 per cent. of the capital stock of the Union Stock Yards & Transit Co. The Chicago management remains the same, with Nathaniel Thayer, President; John B. Sherman, of Chicago, General Manager, and George T. Williams, of Chicago, Secretary. The new company acquires the property of the Union Stock Yards, consisting of 470 acres of improved land, and the capital stock of the Chicago & Indiana State Line Railroad, which has 130 miles of track. The property acquired is well known and has been steadily increasing its business and profits for the past four or five years. Its profits for the six months ending June 30, 1890, were \$600,532 against \$682,826 for the corresponding months in 1889. There has been considerable speculation as to where the control of the new corporation was vested: whether in Vanderbilt or Pennsylvania hands. Mr. Charles Henrotin, the broker who has managed the Chicago end of the deal, denies that there is any friction in the new board. "These stories in the papers," he said, "are without the least foundation in fact. There is nothing to them. The roads are working in perfect harmony." He was uncommunicative as to the plans of the new corporation in regard to the possible removal of the stock yards to a larger and more favorable location. It is not probable that the yards will be removed from their present location at least for some time. That it may become a necessity in the future is quite probable, but as the large packers like Armour own the ground on which their plants are located, it is not likely they will favor the removal of the yards so long as they can be served where they are, and their interests are likely to be consulted in any proposed change. The new deal has given opportunity for a revival of the rumors of an opposition stock yards company to locate on the "Stickney tract," so-called. It is not probable, however, that there is any basis for this. A prominent official of the Stickney system disclaimed any knowledge of any such intention, and said that the company was at work putting in the tracks for the new transfer station, and that was all there was to it.

Grand Rapids & Indiana.—The cars of the Wagner Palace Car Co. have replaced those of Pullman's Palace Car Co. on this road. The road is understood to be controlled by the Pennsylvania Co. through advances and guarantees, and the change in the sleeping cars has given rise to rumors that the Vanderbilts have secured

control of the line. The main line extends from Ft. Wayne, Ind., north to Mackinaw City, Mich., 370 miles. The company also operates the Cincinnati, Richmond & Fort Wayne, extending from Fort Wayne south to Richmond, 96 miles.

Houston & Texas Central.—An injunction has been secured in New York against the Central Trust Co. and others, restraining them from issuing stock of the company or proceeding with its reorganization, on the ground that the trust company had not made the proposed assessment of 73 per cent. as required by the plan of reorganization. In reference to the new assessment of \$71.40 a share, declared last week by the trust company, it is stated that the reduction of \$1.00 had been fixed upon the same calculations as the first assessment, the difference being due to the addition of interest and the deduction of earnings in the hands of the receiver.

Illinois Central.—The net earnings from traffic for the year to June 30, 1890 and 1889 (June, 1890, estimated), were as follows:

	1890.	1889.	Inc. or dec.
Average miles oper.	2,275	2,114	161
Gross earnings.	\$14,450,679	\$12,801,713	I. \$1,648,966
Oper. expen. and taxes.	9,559,659	7,970,572	I. 1,589,087
Per. impr. paid from income.	249,892	256,403	D. 6,511

Total expenses. \$9,809,551 \$8,226,975 I. \$1,582,576
Net earnings. \$4,641,128 \$4,574,738 I. \$66,390

The Dubuque & Sioux City reports its gross and net earnings for the year to June 30 as follows (June, 1890, estimated):

	D. & S. C.	C. F. & M.
	1890.	1889.
Miles.	524	524
Gross earnings.	\$1,901,600	\$1,757,862
Oper. exps. & taxes.	1,448,704	1,372,438
Net earnings.	452,896	385,424 def.

	Both roads.	Increase.
	1890.	1889.
Miles.	600	600
Gross earnings.	\$1,996,118	\$1,855,904
Oper. expen. and taxes.	1,594,641	1,455,730
Net earnings.	401,477	370,168

The Dubuque & Sioux City has expended on permanent improvements \$162,182 which has been charged to capital account. The amount so spent for the corresponding period in 1889 was \$116,527.

New York & Canadian Pacific.—The application of the New York & Albany and the Schenectady & Albany to consolidate under the above title was granted at Albany, N. Y., this week.

Ontario, Carbondale & Scranton.—The first regular passenger trains between Hancock, N. Y., where the connection with the New York, Ontario & Western is made to Scranton, Pa., 54 miles were put on July 21, when the line was formally opened for passenger traffic. Freight trains have been running for over two weeks.

Rocky Fork & Cooke City.—The Northern Pacific announces by circular its purchase of the above road, extending from Laurel to Red Lodge, Mont., a distance of 47 miles. It is now operated by the Northern Pacific.

St. Louis, Arkansas & Texas.—Judge I. C. Parker, of the Western Arkansas District, gave a decree, at Little Rock, on July 15, ordering the sale of that part of the road in Arkansas and Missouri. The foreclosure is made under mortgages in four of the Central Trust and Mercantile Trust companies of New York. The decree is largely a matter of form, being made originally in the United States Circuit Court of New York and subsequently in each of the judicial districts through which the road passes. The sale is ordered to be made by Col. Dyer, Master in Chancery at St. Louis.

St. Louis & San Francisco.—At a special meeting of the stockholders of the company in St. Louis this week, an increase of \$1,000,000 in the capital stock was authorized. The stock will not be issued at present.

Salisbury & Harvey.—The affairs of this New Brunswick company are in rather a complicated condition, arising from the fact that two parties now claim control of the road, each asserting that it has purchased the line from the present managers. A suit in equity has been brought by C. J. Osman, of Hillsboro, N. B., one of the claimants, to prevent the transfer of the line to the other, the National Improvement Co., of New York, and he has secured a preliminary order to prevent the English bondholders from taking that action.

Seattle, Lake Shore & Eastern.—The Oregon Transcontinental Co. has purchased this road in the interest of the Northern Pacific. The company has bought \$3,000,000 of the \$5,000,000 of the capital stock, and has leased the road on the basis of a guarantee of six per cent. interest upon the outstanding bonds and the further issue of bonds that will be necessary to complete the road to the British boundary line. The Northern Pacific will have an annual rental of \$300,000 to pay. The Seattle, Lake Shore & Eastern has, it is stated, thus far earned its interest without difficulty.

Shamokin, Sunbury & Lewisburg.—The company recently created a second mortgage for \$1,000,000, bearing six per cent. interest, the proceeds to be used in double-tracking its line. These bonds were sold to the Finance Co. of Pennsylvania, which organized a syndicate of London bankers to take the issue. The entire issue has been subscribed in that city.

TRAFFIC.

Chicago Traffic Matters.

CHICAGO, July 23, 1890.

The meeting of Western lines which was in session when my last dispatch was sent adjourned on Thursday without having succeeded in raising the east-bound rates. The committee's report provided for an equalization of rates by advancing some rates and reducing others, in order to bring the through rates more into conformity with the sums of the locals. The Santa Fe objected to the proposed reductions on grain west of the Missouri River, on the ground that its grain business was principally west of the river. An attempt was then made to advance the cattle rates from Kansas City to Chicago from 12½ to 22 cents. The Alton agreed to this, provided the business was equitably divided, but the St. Paul objected to dividing the cattle business alone, demanding a division of all business or none. The whole matter was thereupon referred to a new committee, consisting of Chairman Walker, President Cable of the Rock Island, President Manvel of the Atchison, Vice-President Newman of the Northwestern, and General Manager Chappell of the Alton. This committee met on Friday and have been in nearly continu-

ous session since then. On Monday representatives of the St. Paul, the Burlington and the Chicago, St. Paul & Kansas City were present at the conference of the committee by request. To-day the committee arrived at a unanimous agreement on a report which will be submitted to the other interested Southwestern lines on Friday. If they concur, the committee will call a general meeting of all lines and submit the report. The terms of the agreement are not made public, but it is understood to offer a satisfactory solution of the vexed Southwestern problem and one on which all lines can unite.

The alarmists continue to predict a demoralization in passenger rates during the continuance of the G. A. R. excursion to Boston. Charges of secret cutting are freely made, but none are substantiated as yet. Chairman Goddard of the Western Passenger Association does not think that there will be any demoralization in his association. He is receiving many compliments for the able manner in which he is managing the affairs of the new association, in the face of the delicate situation when he took hold.

Chairman Goddard has ordered the withdrawal of all the round-trip \$16.50 rate tickets between Kansas City and Chicago and Western Springs, about which there has been so much contention, on July 18. This completes the restoration of passenger rates.

The California Boards of Trade have sent out an interesting exhibit of California products, which fills two Southern Pacific parlor cars. The exhibit has been on exhibition here the past week.

The recent fatal explosion on the steamer "Tioga," of the Union Line, at the dock here, killing 19 men, has developed an interesting question of liability. The inquest developed the fact that the explosion was due to the presence in the cargo of a quantity of naphtha, shipped by the Genesee Oil Company of Buffalo, marked diamond "B" and invoiced as "oil." The steamboat company disclaimed knowledge of the nature of the shipment, but the oil company claims that it was a common thing to ship naphtha marked in this way and that the transportation companies were knowing to it. The jury brought in a verdict charging the officers of the oil company with manslaughter and censuring the steamboat company.

The Central Traffic Association has decided to put the new uniform bill of lading into effect Aug. 1. The appeals of the shippers to be permitted to use their old shipping receipts until they can supply themselves with the new blanks has been granted until Sept. 30, provided they stamp or print across the face the following statement: "This is a temporary receipt and is to be surrendered in exchange for the company's bill of lading under the terms of which the shipment is made and the goods accepted by the carrier." Old forms on which the conditions of the new bill are printed on the back will be accepted provided the face bears the following: "Subject to all the provisions on the back of this receipt, which are hereby agreed to." The Southern Railway and Steamship Association adopts the new bill of lading Sept. 1. Considerable opposition from shippers is also reported on account of the insertion of the words "non-negotiable."

Numerous misleading dispatches have been sent out in regard to E. A. Mulford's dealings with Chairman Walker, looking towards his employment by the railroads in some capacity, on the ground that he could break up the scalping business, and Mr. Walker's refusal to testify in a suit against Mulford, on the ground that the notary had no legal right to take his testimony. A writ of attachment was sued out to compel Mr. Walker to show cause why he should not testify, and his affidavit presented in response thereto says, among other things:

"There are two grounds upon which the parties have no right to compel me to attend or to depose. First—Because it does not appear that there is any such suit as that recited in the subpoena. No commission has been exhibited from the Kentucky court. . . . The production of the pleadings would show the alleged suit to have been instituted by a Chicago ticket broker or scalper [Mulford] against some alleged association of ticket brokers or scalpers, for the purpose of compelling his reinstatement as a member therein; and that my evidence is in some way expected to be of service to the defendant. The business to which the controversy relates is contrary to the laws of Illinois, and is in great part also contrary to the laws of the United States; it is, as I verily believe, against public policy everywhere, repugnant to good morals, demoralizing to the community, and a public evil of great magnitude. I am confident that upon an inspection of the record this court would refuse to entertain any application whatever based upon it; and that . . . a controversy wherein ticket scalpers have fallen out among themselves would be at once and without ceremony dismissed. Second—I am advised and believe that the statute under which this proceeding purports to be taken is unconstitutional and void. . . ."

In view of statements published in the press that "Mulford was to take a position under the Interstate Commerce Railway Association, at a salary of \$12,000 per year, to stamp out ticket scalpers, and his plan fell through because Walker would not consent to give him the title of Chairman of the Western Passenger Association," Chairman Walker, on Monday, published a card in the Chicago Tribune stating that every word of the above statement is absolutely false.

Traffic Notes.

Inquisitive and mathematically inclined men are wondering how it happens that the buyers on the line of the Santa Fe road in Kansas can pay present prices on corn and still make money out of it, as grain buyers are popularly supposed to do. At a very recent date corn in Chicago was 39½ cents per bushel, and on the same day buyers at Hutchinson, Kan., were paying 20½ cents, leaving a margin of 10 cents per bushel for hauling and other expenses. The published tariff rate from Hutchinson to Chicago is 13½ cents per bushel, which on the face of it leaves 3½ cents per bushel against the buyer, to say nothing of handling charges, commission and shrinkage. In this connection and illustrative of the low moral status of the ordinary law-abiding citizen in connection with railroad matters, it is interesting to note that the papers of that section are encouraging this sort of thing, and urging the roads to keep up the practice regardless of consequences.—*Railway Review.*

The New York Central and West Shore roads on Aug. 4 will put into operation over their entire lines the demurrage system that is in force at the large centres.

The trunk Line Executive Committee has been discussing a plan for a division of the first and second class passenger business out of New York. It is proposed to extend the application of the principle of differential rates. It is said that at present the diversion of immi-

grant business is accomplished by the weaker roads sending immigrants as second-class passengers. The executive committee has advised that Albert Fink be selected as the arbitrator to determine the proper percentages of passenger traffic.

The "Original Package business" done in the city of Wheeling, W. Va., has increased the traffic of the Adams Express Co. alone 200 tons since the decision went into effect. The city is situated close to Ohio and Pennsylvania, both of which are, in a measure, prohibition States, and since the goods must be shipped from one state into another Wheeling drives a big trade with those two States. The "Original Package" liquor business is still in its infancy and many more Wheeling firms are going into it. The Original Package people use the Express lines exclusively, none of the business thus far having been entrusted to the freight lines.

The Interstate Commerce Commission.

Interstate Commerce Commissioners Morrison, Veazey and Schoonmaker were in Boston on Tuesday hearing complaints of the Boston Fruit & Produce Exchange concerning alleged excessive freight rates on peaches from Delaware to Boston. The absence of these commissioners from Washington will delay the publication of the decision on Western grain rates.

The Commission has decided three cases of Procter & Gamble, soap manufacturers, of Cincinnati, against the Cincinnati, Hamilton & Dayton and others in favor of the complainants. The opinion states in effect that in the official classification common soap stands in the fifth class in carload lots, and that the defendant railroad companies have always given it the rate of fifth-class articles. For many years prior to May, 1889, they charged the complainants for only net weight, the gross weight being one-sixth more than net weight; but since May, 1889, they have charged for gross weight without diminishing the rate per 100 lbs. It is held that the increased charge, by the device of charging for the gross weight, being one-sixth advance for the same service, was unwarranted, as it operated to make the rate unreasonable. While the Commission does not expressly decide that the net rate system must be used, it holds that a reduction must be made in order that the rate shall be as low as formerly. This can of course be effected by reducing the classification, but that is a very awkward remedy. The rate on soap is not fixed independently, but its place in the tariff scale is determined by and is correlated to the rates of many other articles. Consequently the disturbance in the soap rates may widely affect the classification. The shipper of many other articles classed with soap will demand a similar reduction, and the whole machinery of classification will be thrown hopelessly out of gear. Therefore the roads naturally dread any interference with it.

The answer of the Delaware, Lackawanna & Western to the complaint filed by John C. Haddock before the Interstate Commerce Commission, charging discrimination against him in the mining and transportation of coal, has been forwarded to the Commission at Washington. It admits that the company mines and sells coal on its own account, but claims to be under a charter expressly authorizing it to act as a miner and merchant of coal, granted prior to the adoption of the present State Constitution and not affected by the Interstate Commerce Act. It claims that its rate of \$1.80 a ton to New York, on anthracite coal, is fair and just, and does not affect Haddock in any event, as he does not pay according to the tariff rate, but according to contracts made between him and the company a number of years ago, whereby he obtained a lower rate; so that if there has been any deviation from the Interstate Commerce Act, it has been in favor of and not against Haddock. The company advanced him large sums of money to purchase his mines, and, to assist him, gave him favorable rates of transportation, and provided for the repayment of its loans in small sums, according to the number of tons of coal shipped. The answer charges Haddock with trying to enforce the contracts in the particulars favorable to himself, and deviate from them in other particulars, and that his proceeding before the Interstate Commission is not in good faith, but for the purpose of harassing and annoying the company, against which he has ample remedy in the courts if it has deviated from its contracts with him. The company respectfully denies the jurisdiction of the Interstate Commission to inquire into its business as a miner and merchant of coal, or as a transporter of its own coal; declares that its published rates are reasonable and just, and its action as a common carrier in harmony with the Interstate Commerce Act, except, perhaps, as to Haddock, who has been favored because of his contracts, which in the view taken by the company are still binding and not subject to modification by the Interstate Commerce Commission.

Philadelphia Car Service Association.

The Philadelphia Car Service Association has been formed jointly by the Pennsylvania, the Philadelphia & Reading and the Baltimore & Ohio, and will go into effect on Sept. 1.

East-bound Shipments.

The shipments of east-bound freight from Chicago by all the lines for the week ending Saturday, July 19, amounted to 54,898 tons, against 60,484 tons during the preceding week, a decrease of 5,586 tons, and against 47,436 tons during the corresponding week of 1889, an increase of 7,462 tons. The proportions carried by each road were:

	W'k to July 19.		W'k to July 12.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central.	7,861	14.3	7,989	13.2
Wabash.	3,436	6.2	4,299	7.1
Lake Shore & Michigan South.	9,525	17.4	9,200	15.2
Pitts., Ft. Wayne & Chicago.	6,649	12.1	8,162	13.5
Chicago, St. Louis & Pitts.	5,693	10.2	6,393	10.6
Baltimore & Ohio.	3,597	6.5	4,991	6.7
Chicago & Grand Trunk.	6,913	12.6	7,990	13.1
New York, Chic. & St. Louis.	5,685	10.4	5,028	8.3
Chicago & Atlantic.	5,649	10.3	7,422	12.3
Total.	54,898	100.0	60,484	100.0

Of the above shipments 1,181 tons were flour, 18,686 tons grain, 1,343 tons millstuffs, 6,669 tons cured meats, 3,027 tons lard, 9,806 tons dressed beef, 2,320 tons butter, 1,520 tons hides, 805 tons wool and 6,226 tons lumber. The three Vanderbilt lines carried 42.1 per cent. of all the business, while the two Pennsylvania lines carried 22.3 per cent.